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Technical Report

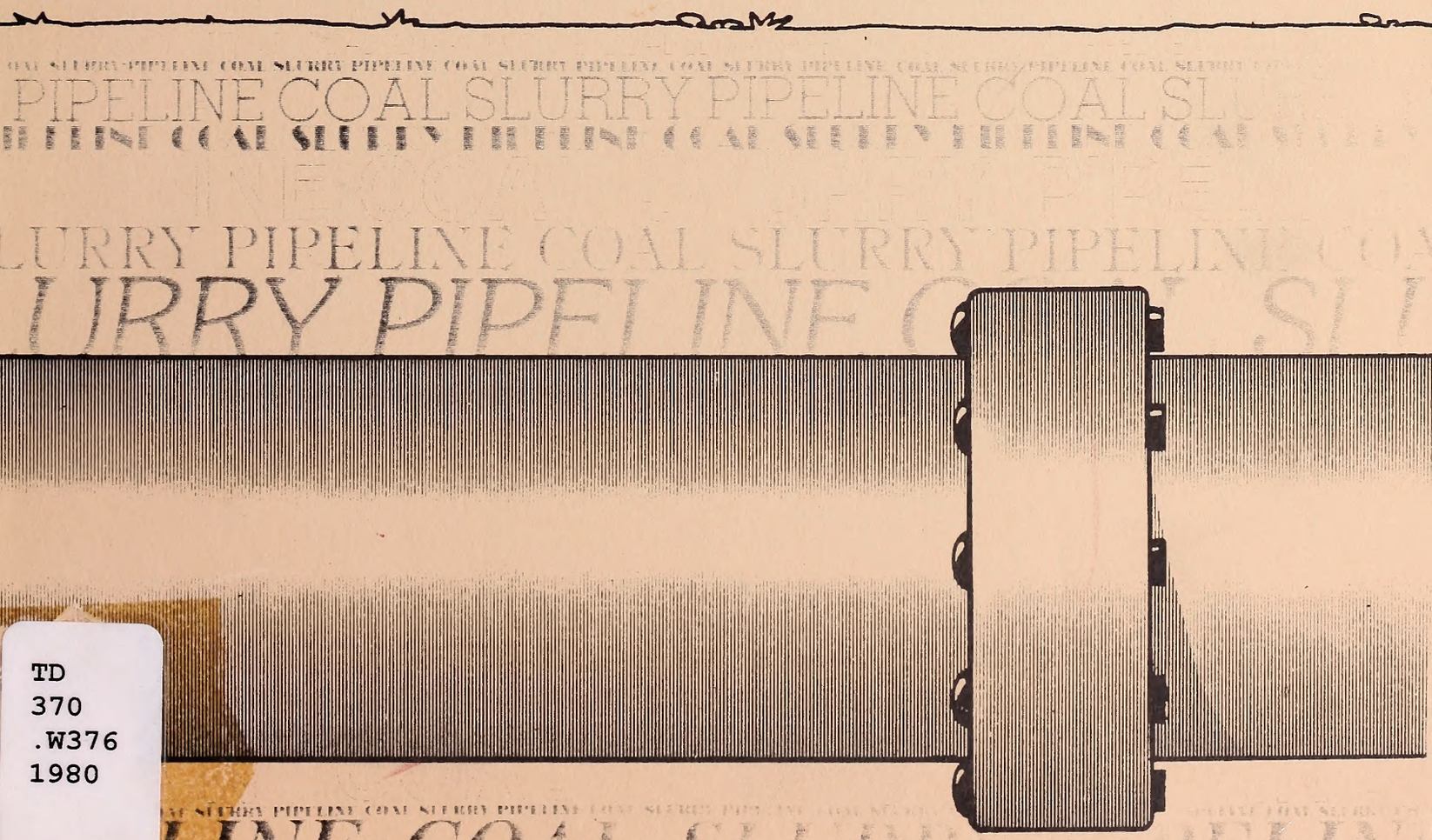
Threatened and Endangered Species

Prepared for

Bureau of Land Management

November 1980

Woodward-Clyde Consultants



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THREATENED AND ENDANGERED SPECIES TECHNICAL REPORT

For the

ETSI Coal Slurry Pipeline Project

November 1980

Prepared for

The Bureau of Land Management

by

Woodward-Clyde Consultants

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Chapter 1
INTRODUCTION

1.A GENERAL

This report, the Threatened and Endangered Species Technical Report, is one of three technical reports that address biological resources that may be affected by the ETSI coal slurry pipeline project. The other two reports addressing biological resources are the Terrestrial Biology Technical Report, and the Aquatic Biology Technical Report. The need for these separate documents results from the new CEQ guidelines, which limit the final EIS document to a discussion of pertinent environmental information and associated impacts.

The initial approach in reviewing potentially affected endangered and threatened species was to consider: those organisms which have been listed, or have been proposed for listing, as threatened or endangered by the Fish and Wildlife Service; those organisms which have been listed, or have been proposed for listing, as threatened, endangered, rare, peripheral, or given any other protected status by any state agencies; and species which appropriate federal and state agency personnel indicated may be included in lists within the next several years. These species are included in the tables in the Appendix.

The species discussed in greater detail in this report include those on the Fish and Wildlife Service Section 7(c) consultation list (Table A2) for the project, two mussel species which are expected to be listed as federally endangered or threatened in 1981 (Chambers 1980), and several state species which may be affected (may affect) by the project.

State level endangered species legislation has been approved in South Dakota, Wyoming, Colorado, Nebraska, and Kansas. These state lists supplement the federal list in these states and afford protection to additional sensitive species in each state. Oklahoma and Arkansas do not have state level endangered species legislation and, consequently, only federally listed species are afforded protection. Although Louisiana has state level endangered species legislation, to date only the federally listed species are afforded protection.

This report is organized into two major sections: Affected Environment and Environmental Consequences. Tables are contained in the Appendix.

1.B DEFINITIONS

Definitions of terms used in the report as they relate to the status of the species are given here.

Endangered

Endangered species means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of the Endangered Species Act would present an overwhelming and overriding risk to man (P.L. 93-205, Endangered Species Act 1973).

Threatened

Threatened species means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (P.L. 93-205, Endangered Species Act 1973).

Threatened by Similarity of Appearance

The Secretary of the Interior may, by regulation, and to the extent deemed advisable, treat any species as an endangered species or threatened

species even though it is not listed pursuant to section 4 of the Endangered Species Act if the Secretary finds that: (1) such species so closely resembles in appearance, at the point in question, a species which has been listed pursuant to such section that enforcement personnel would have substantial difficulty in attempting to differentiate between the listed and unlisted species; (2) the effect of this substantial difficulty is an additional threat to an endangered or threatened species; and (3) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the Endangered Species Act (P.L. 93-205 1973).

Proposed

The Secretary of the Interior, within 90 days of the receipt of the petition of an interested person under subsection 553(e) of title 5, United States Code, can conduct and publish in the Federal Register a review of the status of any listed or unlisted species proposed to be removed from or added to the endangered and threatened species lists, if the Secretary publishes a finding that such person has presented substantial evidence which warrants such a review. Further details of the review process are provided in P.L. 93-205 (Endangered Species Act 1973).

Notice of Review

The Secretary of the Interior may not add species to, or remove such species from, any list published unless the Secretary has first: (1) published notice in the Federal Register and notified the Governor of each State within which such species is then known to occur that such action is contemplated; (2) allowed each such State 90 days after notification to submit its comments and recommendations, except to the extent that such period may be shortened by agreement between the Secretary and the Governor or Governors concerned; and (3) published in the Federal Register a summary of all comments and recommendation received by him which relate to such proposed action (P.L. 93-205, Endangered Species Act 1973).

Status Review

The status of many species is currently being reviewed by the Fish and Wildlife Service. If the Fish and Wildlife Service finds sufficient cause to suspect such a species is actually threatened or endangered, the species will then be proposed for inclusion to the federal list following procedures stated in P.L. 205. During the status review process the Fish and Wildlife Service may solicit data from other sources to aid in their decision. Grants are often awarded to universities and experts to collect field data and review the current status of a species (Chambers 1980).

Chapter 2
AFFECTED ENVIRONMENT

2.A FEDERAL SPECIES

2.A.1 MAMMALS

The federally listed species discussed here are the black-footed ferret, gray bat, Indiana bat, Ozark big-eared bat, Florida panther, and red wolf.

Black-Footed Ferret

The black-footed ferret (Mustela nigripes) may be the rarest mammal on the North American continent (Gates 1973). Original range of the black-footed ferret and prairie dogs coincided in pre-settlement times. The black-footed ferret occupied almost all of the mid- and short-grass prairie region from Saskatchewan and Alberta in the north to areas of New Mexico and Texas in the south (Gates 1973). The black-footed ferret studies of recent times suggest that, while still rare in South Dakota, it may be most abundant in that state (Linder and Hillman 1973; Henderson, et al. 1974). South Dakota, Wyoming, Colorado, Nebraska, and Kansas are the states in the range of the black-footed ferret which would contain components of the ETSI coal slurry pipeline project. Details of sightings of the black-footed ferret within historical times within these states relative to the project are discussed in Chapter 3. The black-footed ferret is believed to be extirpated in Oklahoma (Fish and Wildlife Service 1980b; Lewis and Hassien 1973).

The black-footed ferret was listed as endangered when the endangered species list was first compiled in 1964 (Gates 1973). The ferret

is afforded additional protection by state endangered species acts in South Dakota, Wyoming, Colorado, Nebraska, and Kansas.

Intensive studies of the black-footed ferret to obtain information on its life history were not started until 1964 when a family of ferrets was discovered in Mellette County, South Dakota. Up to that time there was very little in the literature on this predatory mammal. If a concentration of ferrets remains in North America it probably occurs in South Dakota (Snow 1972a; Henderson, et al. 1974).

The prairie dog is the ferret's main source of food. The effect of ferrets on prairie dog populations depends on the size of the town and the number of ferrets present. Parts of towns frequented by ferrets are thinly populated while densities are higher where ferrets are occasional. When a ferret is active during the day, the prairie dogs stay above ground. In the locality of the ferret they may appear very agitated. The prairie dogs frequently cover up the burrows in which ferrets are present or apparently where there is an odor of recent ferret presence. The ferrets seem to have no difficulty digging out of these situations (Snow 1972a; Martin and Schroeder 1978).

Observations to date have been made of single adults and families. The female alone cares for the young, although occasionally the male may stay in the same town. Observers to date have been unable to study young ferrets until they appear above ground, which is generally when they are about half grown. The young ferrets rarely appear during the daylight in the summer, although the female at times may sun-bathe. Both the young and the adults are primarily nocturnal. The behavior patterns of the different families that have been observed are essentially the same (Snow 1972a).

Because very little population data is available, it is difficult to determine whether or not the total ferret population level is declining. The ferret apparently has never been common and has always been difficult to observe. Most ferrets have been observed in association with prairie dogs, and the reduction in prairie dog numbers is probably an indication of reduction in numbers of ferrets (Snow 1972; Henderson, et al. 1974).

Gray Bat

The gray bat (Myotis grisecens) occurs primarily in Alabama, Arkansas, Kentucky, Missouri, and Tennessee; a few colonies occur in Florida, Georgia, Kansas, Indiana, Illinois, Oklahoma, Virginia, and possibly North Carolina (Fish and Wildlife Service 1980a). Kansas, Oklahoma, and Arkansas are the states in the present range of the gray bat which would contain components of the ETSI coal slurry pipeline project. Details of location of the gray bat within these states relative to the project are discussed in Chapter 3.

The gray bat was listed as endangered throughout its range by the Department of the Interior in May 1974 (Federal Register 4/28/76). Supplemental protection is provided for the gray bat in Kansas by a state endangered species act. Oklahoma and Arkansas do not have state level endangered species legislation.

Gray bat colonies are restricted entirely to caves or cave-like habitats. During summer the bats are highly selective for caves providing specific temperature and roost conditions, and in winter they utilize only deep, vertical caves having a temperature of 6 to 11°C. Consequently, only a small proportion of the caves in any area are used regularly. There are nine known caves that are believed to house roughly 95 percent of the hibernating population (Fish and Wildlife Service 1980a).

The population level of the gray bat in 1970 was estimated to be 2.25 million individuals. In 1976, however, a census of 22 important

colonies in Alabama and Tennessee indicated an average decline of more than 50 percent (Fish and Wildlife Service 1980a). Human disturbance and cave vandalism are thought to be primarily responsible for the population decline. Other factors contributing to the decline include pesticide poisoning, natural calamities such as flooding and cave-ins, loss of caves due to inundation by man-made impoundments, and possibly a reduction in insect prey over streams that have been degraded through excessive pollution and siltation (Fish and Wildlife Service 1980a).

Indiana Bat

The Indiana bat (Myotis sodalis) occurs in the midwest and eastern United States from the western edge of the Ozark region in Oklahoma, to southern Wisconsin, east to Vermont, and as far south as northern Florida (Fish and Wildlife Service 1980; Barbour and Davis 1968). Oklahoma and Arkansas are the states in the range of the Indiana bat which would contain components of the ETSI coal slurry pipeline project. Details of location of the Indiana bat in Oklahoma and Arkansas relative to the project are discussed in Chapter 3.

The Indiana bat was determined to be endangered throughout its range by the Department of the Interior in March 1967 (Federal Register 3/11/67). The population level is estimated to be 500,000 individuals (Fish and Wildlife Service 1980a). The Indiana bat mainly utilizes limestone caves for winter hibernation. A few individuals have been found under bridges and in old buildings, and several maternity colonies have been located under loose bark and in the hollows of trees. Summer foraging by females and juveniles is limited to riparian and floodplain areas. Creeks are apparently not used if riparian trees have been removed. Males forage over floodplain ridges and hillside forests and usually roost in caves. Foraging areas average about 11 acres per bat in mid-summer.

The Indiana bat has a definite breeding period that usually occurs during the first 10 days of October (Fish and Wildlife Service 1980a).

Birth usually takes place during June. About 25 to 37 days are required for development of the juveniles to the flying stage (Fish and Wildlife Service 1980a).

The decline of the Indiana bat is attributed to commercialization of roosting caves, destruction by vandals, disturbances caused by increased numbers of spelunkers, and possibly insecticide poisoning. Some winter hibernacula have been rendered unsuitable as a result of blocking or impeding air flow into the caves which results in changes in the cave climate. The Indiana bat is nearly extinct over most of its former range in the northeastern states, and since 1950, the major winter colonies in caves of West Virginia, Indiana, and Illinois have disappeared. A high degree of aggregation during winter makes the species very vulnerable (Fish and Wildlife Service 1980a).

Ozark Big-eared Bat

The Ozark big-eared bat (Plecotus townsendii ingens) is known from only a few caves in northwestern Arkansas, southwestern Missouri, and eastern Oklahoma (Fish and Wildlife Service 1980a and 1980b). Oklahoma and Arkansas are the states in the present range of the Ozark big-eared bat which would contain components of the ETSI coal slurry pipeline project. Details on the location of this bat within these states relative to the project are discussed in Chapter 3.

The Ozark big-eared bat was recently listed as endangered throughout its entire range by the Department of the Interior (Federal Register 11/30/79). According to the Fish and Wildlife Service (1980a) only 100 to 200 Ozark big-eared bats remain.

Maternity and hibernating colonies of Ozark big-eared bats have been found only in caves. The only known maternity colony is in Stillhouse Cave, Lee County, Kentucky (Fish and Wildlife Service 1980a).

The Ozark big-eared bat is dependent on a few specific kinds of caves for hibernating and reproduction. It is highly susceptible to human disturbance and readily abandons roosts when disturbed.

Florida Panther

Historically, the Florida panther (Felis concolor coryi) ranged throughout the southeastern United States including portions of Arkansas, Louisiana, Mississippi, Alabama, Georgia, Tennessee, and South Carolina (Fish and Wildlife Service 1980a; Hall and Kelson 1959). The Florida panther possibly still occurs in a number of small, isolated populations. Arkansas and Louisiana are the states in the historic range of the Florida panther which would contain components of the ETSI coal slurry pipeline project. Details of possible locations of the Florida panther within these states relative to the project are discussed in Chapter 3.

The Florida panther was listed as endangered throughout its range by the Department of the Interior in March 1967 (Federal Register 3/11/67). No habitat preferences have been noted beyond the need for a large wilderness area with an adequate food supply (Fish and Wildlife Service 1980a). Male cougars are known to occupy a range of 25 or more square miles of wilderness area, and females from 5 to 20 square miles. Overhunting and loss of habitat have resulted in the panther's decline.

Red Wolf

Although the red wolf (Canis rufus) was once found in numerous habitats throughout the southeastern United States (Fish and Wildlife Service 1980a), its recent range is restricted to less than 900 square miles in extreme southeast Texas and less than 800 square miles of extreme southwest Louisiana (Carley 1979). Louisiana is the only state in the present range of the red wolf which would contain components of the ETSI coal slurry pipeline project. Details on the possible location of the red wolf relative to the project are discussed in Chapter 3.

The red wolf was listed as endangered throughout its range by the Department of the Interior in September 1970 (Federal Register 10/13/70). The primary habitats within the present range of the red wolf are coastal prairies and marshes.

The primary factors resulting in the decline of the red wolf in North America have been loss of species integrity because of hibridization with the coyote and excessive hunting and trapping. Hybridization probably resulted through expansion of the coyotes range into red wolf territory and the local breakdown of the wolf social structure.

2.A.2 BIRDS

The federally listed species discussed here are the bald eagle, peregrine falcon, whooping crane, Eskimo curlew, Bachman's warbler, red-cockaded woodpecker, and ivory-billed woodpecker.

Bald Eagle

The bald eagle (Haliaeetus leucocephalus) occurs throughout the United States and northward (Fish and Wildlife Service 1980a). They are found primarily along the coasts of North America and inland lakes and rivers from the Gulf of Mexico north to the Arctic (Snow 1973).

All states which would contain components of the ETSI coal slurry pipeline project are included in the range of the bald eagle. Details of location of the bald eagle within the states relative to the project are discussed in Chapter 3. Eagles occurring within the states will be primarily winter residents. Nesting eagles also occur in Wyoming, Colorado, Oklahoma, Arkansas, and Louisiana.

The bald eagle was listed as endangered throughout the forty-eight conterminous states in February 1978 (Federal Register 2/14/78), except for the populations in Washington, Oregon, Minnesota, Wisconsin, and Michigan which are classified as threatened (Federal Register 3/11/67).

The bald eagle has been afforded protection since the passage of the Bald Eagle Act in 1940 (Snow 1973). Along with its federal status, the bald eagle is also protected by state endangered species acts in South Dakota, Wyoming, Colorado, Nebraska, Kansas, and Louisiana.

The bald eagle is associated primarily with riparian habitat, including coasts, rivers, and lakes, usually nesting near bodies of water where they feed. Selection of nesting sites varies depending on the species of trees growing in a particular area. The tops of tall trees, either living or dead, are generally preferred. Regardless of this variation in sites, there are certain general elements which seem to be consistent. These include: (1) the proximity of water (usually within a half mile) and a clear flight path to a close point on the water; (2) the largest living tree in a span; and (3) an open view of the surrounding area. The proximity of good perching trees may also be a factor in site selection. An otherwise suitable site may not be used if there is excessive human activity in the area (Fish and Wildlife Service 1980a).

Wintering bald eagles move southward and gather along rivers, lakes, wildlife refuges, and other places where food is available. Lakes and dams constructed on the Mississippi and the Missouri Rivers have modified the distribution of some wintering bald eagles (Snow 1973). The National Audubon Society's Continental Bald Eagle Project results (winter counts in January) indicated wintering bald eagles concentrated in four areas: (1) approximately 1/3 of the entire continental United States population occurs in the Mississippi Valley; (2) 20 percent are found in the Northwest (Washington, Oregon, Idaho, and Montana); (3) 15 percent occur in Florida (a resident breeding population which is also present in winter); and (4) 5 percent are located along the Middle Atlantic States, particularly the Chesapeake Bay Region (Snow 1973).

Eagles found at roosts during winter and at other times apparently have an attraction to particular trees and even to favorite limbs.

These trees are usually large and open and have sufficient room for take off and landing, but they are not noticeably different from the other trees in the same general area. A favorite tree may hold several eagles before nearby trees are used (Sprunt 1972; Snow 1973).

During 1975 and 1976, the number of breeding pairs in the lower 48 states was estimated at 700 to 1000. Eagle populations in Canada and Alaska are much higher and appear to be doing well (Fish and Wildlife Service 1980a). While the breeding season of bald eagles varies with latitude, the general tendency is for winter breeding in the South with a progressive shift toward spring breeding in the north. In Florida some breeding activity may occur almost year round, except for perhaps in mid-summer.

The former and present distribution of the bald eagle are essentially the same, but numbers in the continental U.S. are reduced from former abundance (Snow 1973). In some areas of the country, pesticide residues in eagles have apparently played a significant roll in their decline. Studies have shown that high residue levels, particularly of dieldrin, have lowered reproductive success by rendering the egg shells thin and easily broken. In other locations, including large parts of Florida, the most significant factors have probably been loss of feeding and nesting sites, and human disturbance during the nesting period. Additional factors responsible for the decline include illegal shooting and the loss of nest trees (Fish and Wildlife Service 1980a).

Peregrine Falcon

The Arctic peregrine falcon (Falco peregrinus tundrius) is found in northern Alaska and across the Canadian tundra. The American peregrine falcon (Falco peregrinus anatum) was originally distributed throughout the rest of Canada and Alaska south of the Arctic peregrine's range. The American peregrine ranged south through the United States and the northern half of Mexico (Chamberlain 1974). It was apparently always rare in the central plains of the United States.

The breeding range for the American peregrine falcon in the eastern United States formerly included the mountainous areas from Maine to northeastern Alabama, however, it no longer breeds in this region (Chamberlain 1974). A few breeding pairs occur in Labrador and the southern boreal forests of Canada. The principal breeding range is the non-Arctic portions of Alaska and Canada south to Baja California, central Arizona and Mexico eastward to the eastern front of the Rocky Mountains (Chamberlain 1974). The Arctic peregrine falcon breeds in the Alaskan and Canadian tundra, migrating through the United States, but wintering south of the United States.

The American peregrine falcon was listed as endangered throughout its range by the Department of the Interior in June 1970 (Federal Register 6/2/70). The Arctic peregrine was similarly classified in October 1970 (Federal Register 10/13/70). According to the Fish and Wildlife Service (1980a) there are around 200 pairs of American peregrines in the western United States, but, based on a 1975 survey, the eastern population has been extirpated. Chamberlain (1974) estimated there were 2000 breeding pairs of Arctic peregrines on this continent.

The basic requirements of the peregrine falcon are an ample food supply, water to bathe in, suitable nesting cliffs, and freedom from human harassment (Chamberlain 1974). Peregrines bathe frequently. Nesting sites are usually chosen in reasonable proximity to a river, lake, or stream offering shallow water areas.

The home range of the breeding pairs varies tremendously, from as little as one quarter square mile to as much as 120 square miles (Chamberlain 1974). The average home range probably covers about 20 square miles.

Peregrines almost always nest on cliffs, although there are a few records of tree nests. The peregrines usually select quite high cliffs

that overlook water. The nesting sites include holes, slits, recesses and ledges. The nest itself consists of a shallow scrape (Chamberlain 1974).

Nesting peregrine falcons do not tolerate excessive human encroachment or prolonged disturbance in the vicinity of the nest (Colorado Division of Wildlife 1978). Breeding peregrines become extremely agitated and may abandon the site if disturbance occurs during the courtship period prior to initiation of egg laying.

In Colorado and other western states, peregrines generally return to the nesting cliffs in late February or early March and initiate courtship activities which continue to mid- or late-April when the eggs are laid (Colorado Division of Wildlife 1978). The eggs hatch from mid- to late-May and fledge in mid-to late-June. The young and adults remain in the vicinity of the nesting cliff up to several months after fledging.

The principal cause of the decline of peregrine populations has been attributed to the presence of chlorinated pesticides, particularly DDT, which have accumulated in the tissues as a result of feeding on contaminated prey. These pesticides reduce the birds' reproductive potential through interference with calcium metabolism. Consequently, eggs are laid with thin shells and are easily broken (Fish and Wildlife Service 1980a).

Whooping Crane

The whooping crane (Grus americana) presently nests only in Woods Buffalo National Park, Canada. The whooping crane winters along the Gulf Coast of Texas on Aransas National Wildlife Refuge and adjacent peninsulas and islands. This birds migratory route is nearly a straight line through west-central North and South Dakota, central Nebraska and Kansas, west-central Oklahoma and east-central Texas.

The whooping crane was listed as endangered throughout its range by the Department of the Interior in March 1967 (Federal Register 3/11/67). Critical habitat for the whooping crane occurs in Nebraska, Kansas, and Oklahoma. All states which contain components of the ETSI coal slurry pipeline project have records of whooping cranes.

The whooping crane has declined for many reasons. This species is extremely intolerant to human disturbance. Hunting was probably an important factor for its initial decline in the early 19th Century. The whooping crane also has a low reproductive rate. These birds usually lay two eggs but rarely raise more than one chick.

Eskimo Curlew

The Eskimo curlew (Numenius borealis) formerly nested in the Arctic tundra and wintered in the grasslands of South America (Fish and Wildlife Service 1980a). The fall migration of the Eskimo curlew began in July. During the fall migrations these birds flew from Nova Scotia over the Atlantic Ocean directly to eastern South America. Spring migration began in late February with the birds arriving on the coasts of Texas and Louisiana in early March. From the Gulf Coast the Eskimo curlew gradually migrated northward through the prairies of the middle United States to eastern South Dakota (Fish and Wildlife Service 1980a).

At one time, the Eskimo curlew probably visited each state which could contain components of the ETSI coal slurry pipeline project. It was listed as endangered throughout its entire range by the Department of the Interior in 1970 (Federal Register 6/2/70). Along with its federal endangered status, the Eskimo curlew is also protected by state endangered species acts in South Dakota, Wyoming, Colorado, Nebraska, Kansas, and Louisiana. Most authors seem to agree that the Eskimo curlew is near extinction.

Excessive killing of Eskimo curlews by market hunters, particularly during the spring migration, drastically reduced the population level

between 1880 and 1890 (Fish and Wildlife Service 1980a). Severe storms during long oceanic migrations, altered habitat on wintering grounds, and altered spring migration routes due to cultivation and grazing probably also contributed to its decline.

Bachman's Warbler

At one time, Bachman's warbler (Vermivora bachmanii) occupied wet forested areas in the southeastern United States during its breeding season (Fish and Wildlife Service 1980a). Nesting usually occurred from late March to early June. The present distribution of Bachman's warbler is unknown but most authorities agree that if the warbler still exists it is most likely in the I'On Swamp area in Berkley and Charleston Counties, South Carolina.

Bachman's warbler was listed as endangered throughout its range by the Department of the Interior in December 1970 (Federal Register 12/2/70).

A precipitous decline in abundance apparently began around 1900 and extended into the 1940s or 1950s. Although the precise cause of this decline is unknown, authorities suspect the loss of habitat in the United States and in Cuba was partially responsible (Fish and Wildlife Service 1980a).

Red-Cockaded Woodpecker

Presently, the red-cockaded woodpecker (Picoides borealis) is found in scattered locations throughout the southeastern United States. Oklahoma, Arkansas, and Louisiana are the states in the present range of the red-cockaded woodpecker which would contain components of the ETSI coal slurry pipeline project. Details on the location of the red-cockaded woodpecker within these states relative to the project are discussed in Chapter 3.

The red-cockaded woodpecker was listed as endangered throughout its range by the Department of the Interior in October 1970 (Federal Register

10/13/70). This woodpecker is afforded supplemental protection in Louisiana by that states endangered species act. The present population level is estimated at 3000 to 10,000 individuals (Fish and Wildlife Service 1980a).

The basic habitat requirement of the red-cockaded woodpecker is the existence of open stands of at least 60 year old pines. Longleaf pine (Pinus palustris) is most commonly used, but other species of southern pine are also acceptable (Fish and Wildlife Service 1980a). Hardwoods and dense pine stands with a dense understory are avoided.

Roosting cavities typically occur in living pines and most frequently in trees which are infected with a fungus producing red-heart disease. Depending on the quality of the habitat the home range of each family unit may vary between 100 and 200 acres.

Eggs are laid during April, May, and June. The female utilizes her mate's roosting cavity for a nest. From egg laying to fledging requires about 38 days and another several weeks are needed before the young become completely independent (Fish and Wildlife Service 1980a).

The decline of the red-cockaded woodpecker is attributed primarily to the reduction of pine forest with trees 60 years old and older. Living pines in this age group infected with red-heart disease provide the specialized nesting sites required by these woodpeckers (Fish and Wildlife Service 1980a). Contemporary forest management practices remove defective and diseased trees.

Ivory-billed Woodpecker

The ivory-billed woodpecker (Camepephilus principalis) was formerly a resident in the south Atlantic and Gulf States from eastern Texas to North Carolina, and north in the Mississippi Valley to Missouri, southern Illinois and southern Indiana (Fish and Wildlife Service 1980a). Most authors agree this woodpecker is now extinct, but during the late

1960s and early 1970s there were unconfirmed sightings from the "Big Thicket" area of east Texas and from southern Louisiana (Lowery 1974).

The ivory-billed woodpecker was listed as endangered throughout its range by the Department of the Interior in March 1967 (Federal Register 3/11/67). This woodpecker required extensive areas of undisturbed, mature stands of lowland hardwood forest. An area of 2-1/2 to 3 square miles is estimated to be the minimum habitat requirement per pair of birds.

Ivory-bills mate for life and normally travel in pairs. Nesting usually occurred in cavities excavated in a dead or partially dead tree. Breeding occurred between January and May (Fish and Wildlife Service 1980a).

The single most important factor triggering the decline of the ivory-billed woodpecker apparently was its diet restrictions to wood boring insect larvae found in dead or dying trees. Modern timber management practices and the loss of virgin hardwood forests have reduced the availability of this food source (Fish and Wildlife Service 1980a).

2.A.3 REPTILES AND AMPHIBIANS

The only federally listed species discussed here is the American alligator.

American Alligator

The American alligator (Alligator mississippiensis) occurs on the Atlantic coastal plain in North Carolina, extending southward and around the U.S. coastline in Texas; and north in the Mississippi drainage to Arkansas and southeastern Oklahoma.

Oklahoma, Arkansas, and Louisiana are the states in the range of the American alligator which would contain components of the ETSI coal

slurry pipeline project. Details of location of the American alligator within these states relative to the project are discussed in Chapter 3.

The American alligator was listed as endangered in Arkansas, Oklahoma, Mississippi, Alabama, North Carolina, Texas, and inland Louisiana; and threatened in Florida, coastal areas of Georgia, South Carolina, and Louisiana in September 1975 (Federal Register 9/26/75). The alligator was first classified as endangered in 1967.

Subsequently, the American alligator has been reclassified (Federal Register 1/10/77 and 6/25/79) as threatened by similarity of appearance in twelve Louisiana parishes (Fish and Wildlife Service 1979). Reclassification in these Louisiana parishes to the less restrictive category indicates that the alligator is unlikely to become endangered in the near future in these parishes, and that no harm will be done to the species by controlled harvest in those areas. Other southeastern alligator populations remain classified either as endangered or threatened. Alligators in the remaining Louisiana coastal parishes remain classified threatened, and those in Louisiana's inland parishes remain classified endangered.

The habitat of the American alligator includes river systems, canals, lakes, swamps, bayous, and coastal marshes. Studies conducted by the Louisiana Wildlife and Fisheries Commission indicate that alligators may move for a considerable distance, and that males move farther than females (Fish and Wildlife Service 1980a). The minimum home range for males averaged 3162 acres, and for females 21 acres. Minimum daily travel for males averaged 2411 feet, and for females 79 feet. The studies alsc showed that males utilize large open bodies of water to a much greater extent than females (Fish and Wildlife Service 1980a).

The American alligator, for most of its range, overwinters in an inactive state or hibernation, from about mid-November to mid-March. Following hibernation the sexually mature alligators (usually 6 feet or

larger) actively search for a mate. The courtship takes place in April. The female begins to build her nest during the first part of June. The nest is usually built 10 to 15 feet from water in a shady spot free of danger from flooding or drying. Hatching usually occurs from the last of July to mid-August but may extend into late August or early September. The hatchlings work their way up out of the nest and disperse into the surrounding habitat, sometimes with the female in attendance, and begin feeding in preparation for hibernation (Gulf South Research Institute 1976).

Population levels are estimated at about 3/4 of a million, with about 75 percent of this number occurring within the area of threatened or threatened by similarity of appearance status. Estimates of total state populations in 1974 were as follows: South Carolina, 48,700; Georgia, 29,954; Florida, 407,585; Louisiana, 200,682; Texas, 26,784; Mississippi, 4,740; Alabama, 12,715; North Carolina, 1,314; Arkansas, 1,900; Oklahoma, 10. In recent years the alligator has increased in numbers in many areas (Fish and Wildlife Service 1980a).

Alligator populations are estimated to have reached all time lows in the late 1950s and early 1960s. Records in Louisiana, for example, show that the alligator take dropped from about 36,000 hides in 1948-49 to about 1,100 in 1960-61. The Department of the Interior determined the alligator to be an endangered species as a result of excessive exploitation and through habitat loss resulting from human encroachment. The first mentioned factor, which involves both over hunting and illegal poaching, is considered the most important factor (Fish and Wildlife Service 1980a).

2.A.4 FISHES

Project components of the ETSI coal slurry pipeline would not approach the known habitat of federal endangered, threatened, proposed or notice of review fishes (Appendix Table A2). Consequently, none of

the federal fish species which occur in states containing project components are discussed in this report.

2.A.5 INVERTEBRATES

The invertebrates discussed here are two mussel species under consideration for federal listing (Neosho pearly mussel and Wheeler's pearly mussel) and the federal endangered fat pocketbook pearly mussel.

Neosho Pearly Mussel

Historically, the Neosho pearly mussel (Lampsilis rafinesqueana) occurred in the Illinois River in Arkansas (Gordon, et al. 1979) and in northeastern Oklahoma (White 1979). The Department of the Interior (1974) listed this mussel as occurring in the Neosho River system, Oklahoma.

According to Chambers (1980) the Fish and Wildlife Service will attempt to list this species as threatened or endangered in fiscal year 1981. At that time, critical habitat would be designated.

Factors which have resulted in the decline of this species include impounding of large river habitat, pollution, dredging, channelization, siltation and overharvesting of the shell.

Wheeler's Pearly Mussel

According to the Department of the Interior (1974) Wheeler's pearly mussel (Arkansia wheeleri) occurs in the Kiamachi River in Oklahoma. Burch (1973) suggested that this mussel also occurred in the Arkansas River in Oklahoma. A recent publication by Gordon, et al. (1979) indicates that this mussel is also known from the Ouachita and Little Rivers, Arkansas. It has been reported from medium to larger sized streams in a few Ouachita Mountain tributaries to the Red and Arkansas Rivers (White 1979).

According to Chambers (1980) the Fish and Wildlife Service will try to list Wheeler's pearly mussel and designate critical habitat in fiscal year 1981. Presently, Wheeler's pearly mussel is considered a status review species by the Fish and Wildlife Service.

Factors which have resulted in the decline of this species include impounding of large river habitat, pollution, dredging, channelization, siltation, and overharvesting of the shell.

Fat Pocketbook Pearly Mussel

The fat pocketbook pearly mussel (Proptera capax) is found in various portions of the Mississippi River drainage (Burch 1973). It has been collected from both flowing and still water habitats with varied benthic substrates although it seems to prefer slow water and sand-silt substrates (Army Corps of Engineers 1979). It has been collected from shallow waters of just a few inches to depths of more than 8 feet (Parmalee 1967). The historic range of the fat pocketbook includes portions of Arkansas, Indiana, Missouri, and Ohio (Federal Register 5/20/80). Arkansas is the only state in the historic range of this mussel which would contain components of the ETSI coal slurry pipeline project.

The fat pocketbook pearly mussel was listed as endangered throughout its range by the Department of the Interior in June 1976 (Federal Register 6/14/76).

Factors which have resulted in the decline of the species include impounding of large river habitat, pollution, dredging, channelization, siltation, and overharvesting of the shell.

2.A.6 PLANTS

The only project component of the ETSI coal slurry pipeline which would approach the known habitat of federally endangered or threatened

plants is the Colorado Alternative. This alternative route would traverse an area near Cheyenne, Wyoming where the Colorado butterfly-weed (Guara neomexicana coloradensis) is known to occur. This plant is not presently listed (October 1980) but will be listed by December 1980 (Boyd 1980).

2.B STATE SPECIES

2.B.1 MAMMALS

The only state listed species discussed here is the northern swift fox.

Northern Swift Fox

The historic range of the swift fox (Vulpes velox) included the Great Plains from the southern Canadian provinces to the Texas panhandle (Sharps 1980). Wyoming and Colorado have stable populations of this fox while only remnant populations survive in South Dakota and Nebraska. The swift fox is threatened in South Dakota and endangered in Nebraska.

Swift fox are usually found on short- to mid-grass prairie and are closely associated with prairie dog colonies (Sharps 1980). The spring and summer home range is approximately one square mile. The winter home range is probably expanded.

Swift fox excavate their own dens or modify prairie dog burrows or badger diggings (Hillman and Sharps 1978). Breeding probably occurs in early March and the pups occupy natal dens until late May or early June. The young appear to stay with the family groups until dispersal in late August and September (Hillman and Sharps 1978).

With settlement of the Great Plains, swift fox numbers decreased, and by the turn of this century the species was rare in its northern range. No sightings were reported in North Dakota from 1915 to 1970, in South Dakota from 1914 to 1966, and in Nebraska from 1901 to 1953 or 1954 (Jones 1964; Pfeifier and Hibbard 1970; McDaniel 1976). Since the

1960s occasional sightings of swift fox have been reported in Nebraska, South Dakota, and North Dakota (McDaniel 1976). In 1975 three dens were located in southern Shannon County in South Dakota (Hillamn and Sharps 1978). The decline of the swift fox can be directly associated with changes in land use such as plowing native prairie, predator control, rodent control, trapping and increased hunting pressure (Sharps 1980).

Recently, population levels of the swift fox appear to be expanding especially in Colorado, Wyoming, and Kansas. Populations in Nebraska and Oklahoma are probably stable (Sharps 1980). The South Dakota population, although small, is increasing.

2.B.2 BIRDS

The state listed species discussed here are the interior least tern and the greater prairie chicken.

Interior Least Tern

The interior least tern (*Sterna albifrons athalossos*) occurs as a breeding bird in Texas, Oklahoma, Kansas, South Dakota, Nebraska, Arkansas, Tennessee, Illinois, and Mississippi. Further location details are discussed in Chapter 3.

The interior least tern is a state endangered species in South Dakota, and a state threatened species in Nebraska and Kansas.

River sandbars, sandflats and other similar habitat are required for nesting. Least tern populations have experienced declines due to destruction and disturbance of large, open sandbars that serve as nesting sites. Existing nesting habitat is threatened with destruction. Because of man's many activities that cause reductions in water flows, the scouring effect of the rivers has been minimized or eliminated in some areas, resulting in narrower channels and many more trees on sites that were once open sandbars (Nebraska Game and Parks Commission 1977).

Greater Prairie Chicken

The greater prairie chicken (Tympanuchas cupido pinnatus) formerly occurred in south-central Canada and the United States east of the Rocky Mountains, except the southeastern states (Bent 1932). South Dakota, Colorado, Nebraska, Kansas, and Oklahoma are the states in the present range of the greater prairie chicken which contain components of the ETSI coal slurry pipeline project. Details of the location of the greater prairie chicken within these states relative to the project are discussed in Chapter 3.

The greater prairie chicken is a state endangered species in Colorado (Colorado Division of Wildlife 1978). While not officially listed by the State of Oklahoma (no official endangered and threatened species list exists at the state level for Oklahoma), a particular concern in Oklahoma exists for this gamebird (Gomez 1979; Short 1979).

The greater prairie chicken has evolved in and depends upon, native tall-grass and mid-grass prairies. Throughout its range the major limiting factor is the lack of adequate nesting and brood-rearing habitat. Habitat quality increases as tall-grass height and density increases, shrub density decreases and the percentages of bare ground decreases (Colorado Division of Wildlife 1978). Formerly, the greater prairie chicken ranked first among the gamebirds of the prairies of the Midwest (Bent 1932). Intensive agriculture has reduced the range of the greater prairie chicken to a fraction of the area formerly occupied.

A critical period for prairie chickens occurs during the spring courtship. Populations are concentrated in specific areas during this time (March into June, but primarily in April and May). Males "strut" and "boom" in courting the females, thus the reference to strutting or booming grounds. The nest of the prairie chicken is on the ground, but the character of the vegetation in which it is built varies. Generally the nesting site is among grasses and weeds or low shrubbery in very

open situations, but sometimes it may be adjacent to trees. The vegetation about the nest is usually very thick and effectively conceals the eggs and the incubating bird from view (Brent 1932).

2.B.3 REPTILES AND AMPHIBIANS

No state protected reptiles or amphibians are known to occur in the vicinity of any project components.

2.B.4 FISHES

The state listed species discussed here are the northern redbelly dace, finescale dace, sturgeon chub, longnose sucker, plains orangethroat darter, Topeka shiner, and Arkansas darter.

Northern Redbelly Dace

The northern redbelly dace (Phoxinus eos) occurs in boggy lakes, creeks, and ponds, from Nova Scotia south to New York and Pennsylvania on the east, west through portions of the Great Lakes drainage to Colorado (Scott and Crossman 1973). This dace is listed as threatened in South Dakota and Nebraska.

This dace seems to prefer the quiet waters of beaver ponds, bog ponds, small lakes, or quiet pool-like expansions of streams, often over a bottom of finely divided detritus or silt. The northern redbelly dace spawns in spring and early summer (Scott and Crossman 1973).

Finescale Dace

The finescale dace (Phoxinus neogaeus) occurs in bog ponds, streams, and lakes from Maine and New Hampshire on the east, through southern Quebec and northern New York State, north of the lower Great Lakes to Michigan, and northwest in the Mackenzie River system. Relic populations occur in South Dakota, Wyoming, Colorado, and Nebraska (Bailey and Allum 1962).

The finescale dace is listed as threatened in South Dakota and Nebraska. Preferred habitats seem to be the cool bog lakes, streams, and some larger lakes of the central and northern part of the continent (Scott and Crossman 1973). Spawning occurs in the spring.

Sturgeon Chub

The sturgeon chub (Hybopsis gelida) is native to the Missouri River system. In South Dakota, this fish is threatened. The South Dakota distribution of the sturgeon chub includes records from the Cheyenne, White and Grand River basins (Bailey and Allum 1962).

The sturgeon chub inhabits shallow areas with strong current and gravel bottoms. In addition, it has been found in turbulent areas where shallow water flows across sandbars, particularly at the upstream ends of small sand islands where the channel divides (Cross and Collins 1975). The sturgeon chub is well adapted to life in the turbid rivers of the plains.

Longnose Sucker

In North America the longnose sucker (Catostomus catostomus) occurs from central Quebec and western Labrador south to Maryland, west through Pennsylvania, north to Minnesota, absent from all but the upper Mississippi in Minnesota, to northern Colorado, north through Washington to Alaska (Scott and Crossman 1973). In the northern portion of its range, it is the most widespread and successful cypriniform in the region. Its occurrence in the south is more sporadic and patchy. The longnose sucker is threatened in South Dakota.

Spawning typically begins once water temperatures reach 5°C (usually in mid-April through mid-May).

Plains Orangethroat Darter

The plains orangethroat darter (Etheostoma spectabile pulchellum) is considered threatened in Colorado. In Colorado this darter historically inhabited the Republican River drainage, and perhaps the lower South Platte River drainage.

The plains orangethroat darter occurs in small streams with spring-fed branches. It prefers shallow riffles and runs with substrate of sand or mixed sand and gravel. The plains orangethroat darter avoids streams with strong continuous flow, and is somewhat tolerant of intermittent flows and occasional siltation (Colorado Division of Wildlife 1978).

Spawning occurs in May and June when water temperatures reach 60° to 70°F. The eggs are buried in fine gravel of shallow riffles (Colorado Division of Wildlife 1978).

Topeka Shiner

Although the Topeka shiner (Notropis topeka) was formerly widespread in Kansas it is now restricted to tributaries of the Kansas River in the Flint Hills plus a very few streams elsewhere in the state (Cross and Collins 1975). The Topeka shiner is listed as threatened by Kansas endangered species legislation.

The Topeka shiner normally occupies large, open pools of small streams. These streams may become intermittent during summer months. Water levels are usually kept up by weak springs or percolation through gravel beds between pools. Pools with populations of this species are usually relatively clear. Pollution, especially in the form of turbidity, is apparently responsible for the reduction in population levels of the Topeka shiner.

Arkansas Darter

The distribution of the Arkansas darter (Etheostoma cragini) is restricted to isolated populations in the Arkansas River basin in eastern Colorado, southern Kansas, northeastern Oklahoma, southwestern Missouri, and northwestern Arkansas (Cross and Collins 1975). The localization of populations results from the paucity of optimum habitat. Blair and Windle (1961) considered optimum habitat for the Arkansas darter as a spring or spring-run filled with watercress (Nasturtium

officinale), although this darter has been reported from habitats lacking watercress by several investigators (see Cloutman 1970). The Arkansas darter is the only darter existing in southwestern Kansas west of 99° 30' west longitude (Cloutman 1970).

Although the Arkansas darter is officially protected only in Kansas and Colorado, discussions with the Office of Endangered Species (Williams 1980) suggest that this darter may be listed as federally threatened in the near future.

The reproductive habits of captive Arkansas darters were observed by Distler (1972). The Arkansas darter apparently spawns in late March in Colorado (Ellis and Jaffa 1918), from mid-February to April in Oklahoma (Miller and Robinson 1973), and from March to May in Kansas (Cross and Collins 1975). Spawning typically occurs in shallow water over a substrate of coarse gravel (Ellis and Jaffe 1918).

The Arkansas darter is tolerant of fluctuating water levels and sluggish currents of the streams in dry climates, however, it is apparently less tolerant of turbidity. Cloutman (1970) suggested that increased turbidity resulting from modern cultivation practices have severely reduced Arkansas darter populations in the Arkansas River basin.

2.B.5 INVERTEBRATES

State protected invertebrates are not known to occur in the vicinity of any project components.

2.B.6 PLANTS

At the present time, state level endangered species legislation does not protect plant species in states which would contain components of the coal slurry pipeline project.

Chapter 3
ENVIRONMENTAL CONSEQUENCES

3.A FEDERAL SPECIES

3.A.1 MAMMALS

The federally listed species discussed here are the black-footed ferret, gray bat, Indiana bat, Ozark big-eared bat, Florida panther, and red wolf. It is the opinion here that a "may affect" exists for the black-footed ferret. It is the opinion here that the gray bat, Indiana bat, Ozark big-eared bat, Florida panther, and red wolf will not be affected by the proposed ETSI coal slurry pipeline project.

Black-Footed Ferret

Colonies of prairie dogs are potential habitat for the black-footed ferret (Henderson, et al. 1969; Snow 1972; Clark 1977; Martin and Schroder 1978). Prairie dog colonies could potentially occur along most of the alignments and on most surface facility sites in South Dakota, Wyoming, Colorado, and Nebraska; along much of the alignments in Kansas; and along smaller portions in Oklahoma. For this project, Section 7 of the 1973 Endangered Species Act will require that a "may affect" exists for the black-footed ferret in all of these states (except Oklahoma) where prairie dog colonies are to be disturbed by construction of the pipeline unless field surveys have determined the probable absence of the ferret during the time the surveys are carried out (Table A9). While the probability is extremely low that a black-footed ferret will be present within any single prairie dog colony to be disturbed by construction, recent information suggests it may still occur in all of these states except Oklahoma.

In recent years, the black-footed ferret has been reported from South Dakota (Henderson, et al. 1969), Wyoming (Schroeder 1979; Hehnke 1979; Clark and Dorn 1979), Colorado (Colorado Division of Wildlife 1978; Torres 1973), Nebraska (Lock 1977; Lock 1973), and Kansas (Queal, et al. 1977). No recent sightings have been reported from Oklahoma even though intensive surveys were conducted (Glass 1975; Lewis and Hassien 1973). Glass (1975) and the Fish and Wildlife Service (1980b) believe the ferret to be extirpated in Oklahoma.

While prairie dog colonies still exist in the states as detailed above the colonies have been much reduced and isolated as a result of efforts to control prairie dog populations. Any prairie dog colony could provide suitable habitat for the black-footed ferret but several towns, including some large ones, in relatively close proximity and with a stable prairie dog population appear to be necessary for the maintenance of a ferret population (Black-footed Ferret Recovery Team 1978; Colorado Division of Wildlife 1978; Queal, et al. 1977).

The disturbance associated with pipeline construction could result, at least temporarily, in the loss of portions of some prairie dog colonies. The amount of habitat (or colony) disturbed during pipeline construction is limited when viewed from an acreage assessment (a 100 foot wide slurry line right-of-way converts to 12.12 acres per mile and a 50 foot wide water line right-of-way would disturb 6.06 acres).

In South Dakota more sightings of black-footed ferrets have been made in historical times than any state; more than 400 sightings have been reported since 1889 (Linder and Hillman 1973). Most of these occurred in the western half of the state, with the greatest number in Mellette and Washabaugh Counties (Linder and Hillman 1973). From 1964 to 1973 black-footed ferrets were seen as follows: at 17 different prairie dog towns in Mellette County; at 2 different towns in Washabaugh County; and at one in Shannon County. The Oahe Alternative in South

Dakota would be located approximately 45 to 65 miles north of these sightings. A recent sighting of a ferret was made on 28 March 1979 near Okreek in Mellette County, about 75 miles south of what would be the beginning of the Oahe Alternative in South Dakota (Anderson 1980). In addition to the ferret sightings the greatest concentration of black-tailed prairie dog towns in South Dakota occurs in counties south of the proposed Oahe Alternative. From east to west, counties which would be traversed by the Oahe Alternative have the following estimated acreages of dog towns (Henderson, et al. 1974): Stanley County (south of the Cheyenne River), 500 acres; Haakon County (south of the Cheyenne River), 800 acres; Meade County, 2500 acres; and Lawrence County, 100 acres. If any of these prairie dog colonies would be traversed a "may affect" from construction will exist for the ferret until appropriate surveys have been completed. The completion of such work will represent a best effort, even though it will not prove conclusively the absence of the ferret (Linder and Hillman 1973). The ferret would not be affected by operation, maintenance, and abandonment of the project in South Dakota.

In Wyoming a number of sightings of the ferret have been made (Clark 1973, 1978; Hehnke 1979). Information for counties affected by the project are summarized here (Clark 1978):

	Ferret Reports		
County	1851-1969	1970-1975	Prairie Dog Acreage in County
Crook	4	2	3,000 acres (Black-tailed Prairie Dog)
Campbell	3	1	30,000 acres (Black-tailed Prairie Dog)
Weston	4	1	4,000 acres (Black-tailed Prairie Dog)
Converse	2	2	8,000 acres (Black-tailed Prairie Dog)
Niobrara	4	-	2,000 acres (Black-tailed Prairie Dog)
Goshen	1	-	5,000 acres (Black-tailed Prairie Dog)
Laramie	4	-	1,500 acres (Black-tailed Prairie Dog)

If any prairie dog colonies would be traversed in Wyoming a "may affect" from construction will exist until appropriate surveys have

failed to locate a ferret in such towns. The ferret would not be affected by operation, maintenance, and abandonment of the project in Wyoming.

In Colorado no confirmed sightings of black-footed ferret have been made recently. A single skull of a ferret estimated to be from the 1960s was found in northeastern Colorado (Kit Carson County about 30 miles south of Colorado Alternative MP 340) (Bissel, et al. 1978). At present it cannot be stated that the black-footed ferret does or does not exist in Colorado (Colorado Division of Wildlife 1978; Bissell, et al. 1978, 1979). However, black-tailed prairie dog towns are abundant in eastern Colorado and consequently, potential ferret habitat is abundant (Bissell, et al. 1978, 1979). From west to east counties which would be traversed by the Colorado Alternative have the following estimated acreages of dog towns (Bissell, et al. 1978, 1979): Weld, 2100 acres (55 dog towns); Logan, 3500 acres (82 dog towns); Washington (no data); and Yuma, 800 acres (66 dog towns). If any of these prairie dog colonies would be traversed a "may affect" from construction will exist for the ferret until appropriate surveys have been completed. The ferret would not be affected by operation, maintenance, and abandonment of the project in Colorado.

In Nebraska a little more than a dozen (14) reliable sightings of black-footed ferrets had been made since about 1965 (Nebraska Game and Parks Commission 1977). The 14 sightings were made at 12 different locations in nine counties primarily in the panhandle and southwest region of the state (Nebraska Game and Parks Commission 1977). County by county information on dog towns and specific location of sightings were not available. Prairie dog colonies are present in 48 of the 93 counties and the total state acreage of prairie dog towns is probably 10 to 12 thousand acres (500 to 600 separate dog towns) (Lock 1973). If any of the prairie dog colonies would be traversed a "may affect" from construction will exist for the ferret until appropriate surveys have been completed. The ferret would not be affected by operation, maintenance, and abandonment of the project in Nebraska.

In Kansas one ferret was observed in Cheyenne County in 1975 (Kansas Fish and Game Commission 1977). The sighting was made about 5 miles north of MP 355 of the proposed Colorado Alternative pipeline in Kansas. The last time a ferret was collected in Kansas was in 1957 (Kansas Fish and Game Commission 1977). About a half dozen sightings of ferrets are reported during the period of 1969 to 1973 (Henderson and Little 1973); three of these were in counties which would be crossed by alignments in Kansas (Cheyenne, Trego, and Barton Counties).

From west to east counties along the Colorado Alternative which would be traversed have the following estimated acreages of dog towns (Henderson and Little 1973): Cheyenne, 2300 acres (55 towns); Sheridan, 450 acres (3 towns); Thomas, 200 acres (5 towns); Gove, 900 acres (35 towns); Trego, 800 acres (8 towns); Ellis, 25 acres (3 towns); Rush, 35 acres (3 towns); Barton, 170 acres (8 towns); and Rice, 45 acres (2 towns). From west to east counties which would be crossed by the Proposed Action (excluding Trego, Ellis, Rush, and Barton listed under Colorado Alternative) have the following estimated acreages of dog towns (Henderson and Little 1973): Decator, 140 acres (8 towns); Norton, 240 acres (10 towns); Graham, 1500 acres (49 towns); Stafford, 500 acres (23 towns); Reno, 80 acres (13 dog towns); Kingman, 200 acres (6 towns); Harper, 70 acres (6 towns); and Sumner, 70 acres (5 towns). From west to east counties which would be traversed by the Market Alternative (excluding Decator, Norton, and Rice listed above) have the following estimated acreages of dog towns (Henderson and Little 1973): Phillips, 300 acres (5 towns); Rooks, 800 acres (11 towns); Osborne, 2400 acres (36 towns); Russell (no prairie dog town acreage reported); Ellsworth, 70 acres (5 towns); McPherson, 40 acres (4 towns); Harvey, 5 acres (1 town); Sedgwick, 140 acres (4 towns); Butler (no prairie dog towns reported); Cowley, 5 acres (1 town); and Chautauqua, none as it is considered to be out of the range of the black-tailed prairie dog. Queal and Wood (1980) believed most prairie dogs along the alignments could occur along the Colorado Alternative between the Colorado-Kansas state line to about MP 400. If any of these prairie dog colonies would

be traversed a "may affect" from construction will exist for the ferret until appropriate surveys have been completed. The ferret would not be affected by operation, maintenance, and abandonment of the project in Kansas.

In Oklahoma the black-footed ferret is believed to be extirpated (Glass 1975; Lewis and Hassien 1973; Fish and Wildlife Service 1980b). Nearly all prairie dog towns are south and west of the proposed alignments in Oklahoma. The ferret will not be affected in Oklahoma if prairie dog colonies are traversed. The ferret would not be affected by construction, operation, maintenance, and abandonment of the project in Oklahoma.

Gray Bat

The only record of the gray bat (Myotis grisescens) in Kansas is from Cherokee County in extreme southeastern Kansas (Hays and Bingman 1964). All Kansas components of the ETSI coal slurry pipeline project are located in the central and western portions of the state. The closest project component to Cherokee County would be the Market Alternative route which would run approximately 100 miles to the west. The gray bat would not be affected by construction, operation, maintenance, and abandonment of the project in Kansas.

The present distribution of the gray bat in Oklahoma includes the limestone cave regions of Adair, Cherokee, Delaware, and Ottawa Counties in the northeastern corner of the state (Fish and Wildlife Service 1980b). Components of the ETSI coal slurry pipeline project would be located well east and south of the state's limestone cave region (Gunier 1980). Although proposed pipeline routes would traverse portions of Cherokee and Adair Counties, the corridor would be south of the limestone cave region (LaVal 1980; Gunier 1980) and, consequently, maternity and hibernacula would not be disturbed. The gray bat would not be affected by construction, operation, maintenance, and abandonment of the project in Oklahoma.

According to McDaniel and Gardner (1977), the gray bat is still abundant and widely distributed in the cave region of northern Arkansas. The gray bat occurs in the limestone and sandstone cave region of the northern portion of the Arkansas Ozarks that is comprised by the Salem and Springfield plateaus. Maternity colonies are known from Benton, Madison, Stone, and Washington Counties (Sealander 1979). Large hibernating colonies occur in Baxter, Benton, and Stone Counties (Harvey 1976). These counties would not contain project components of the ETSI coal slurry pipeline.

From the Oklahoma-Arkansas state line to MP 997.4 the Market Alternative and Proposed Action corridor would cross the Arkansas River Valley subdivision. This area is well south of the Salem and Springfield plateaus (Arkansas Department of Planning 1974). The surface geology of the Arkansas River Valley is primarily Pennsylvanian sandstone and, consequently, the area lacks the suitable cave habitat required by the gray bat. A small portion of the Independence Lateral would traverse the Springfield Plateau subdivision between MP 75 and 90 in southern Independence County. According to Barkley (1980) only one gray bat colony is known from Independence County. Bone Cave supports a nursery colony of approximately 18,000 gray bats (Harvey 1976). Bone Cave is located in western Independence County approximately 15 miles northwest of the proposed Independence dewatering facility (Harvey 1976). No records of gray bats colonies are known to occur along the Independence Lateral.

Since the gray bat is restricted to the northern Arkansas highlands area, the gray bat would not be affected by construction, operation, maintenance, and abandonment of the project in Arkansas.

Indiana Bat

For the most part, Indiana bats (Myotis sodalis) utilizes limestone caves for winter hibernation. Several maternity colonies have been

found under loose bark and in the hollow of trees. Approximately 87 percent of the entire population hibernates in only seven caves (Fish and Wildlife Service 1980a).

Females and juveniles forage exclusively in riparian and floodplain areas. Apparently, these areas are avoided if riparian cover is removed (Fish and Wildlife Service 1980a). Since the forage area of each individual averages 11 acres, the loss of riparian vegetation at stream crossings would not significantly affect this bats' foraging habitat.

Eastern Oklahoma is the extreme western edge of the known range of the Indiana bat. Glass (1975) reported Oklahoma records from Adair and Leflore Counties. The Fish and Wildlife Service (1980b) reported additional collections from caves in Delaware and Pushmataha Counties. The Market Alternative pipeline corridor would traverse southwestern Adair County between MP 447 and 464. According to Drs. LaVal (1980) and Gunier (1980) the portion of Adair County which would be affected by components of the ETSI coal slurry pipeline is southwest of the limestone cave region. Consequently, the Indiana bat would not be expected to occur in the affected area in Oklahoma.

Sealander (1956) reported Indiana bats from Baxter, Independence, Izard, Searcy, Stone, and Washington Counties in Arkansas. Additional records exist from Newton, Benton, and Garland Counties. Independence County would be the only Arkansas County with records of Myotis sodalis and components of the ETSI coal slurry pipeline project. According to Drs. LaVal (1980) and Gunier (1980) and Barkley (1980) the Independence Lateral would not affect the Indiana bat in Arkansas. Concluding, the Indiana bat would not be affected by construction, operation, maintenance, and abandonment of the project.

Ozark Big-eared Bat

According to the Fish and Wildlife Service (1980b) the Ozark big-eared bat (Plecotus townsendii ingens) has been reported from Cherokee

and Adair Counties in eastern Oklahoma. These Oklahoma records consist of occasional specimens found in caves. This species has never been encountered in large numbers (Fish and Wildlife Service 1980b). The Market Alternative pipeline corridor would traverse both of these counties between approximately MP 419 to 464.

If this bat does occur in Oklahoma it would undoubtedly be found in the cave region of the northeastern portion of the state. The Fish and Wildlife Service (1980b) reported its present Oklahoma range is restricted to Adair and Cherokee Counties. Although components of the ETSI coal slurry pipeline project could traverse Adair and Cherokee Counties, the corridor would not affect caves. Since the primary concern seems to be potential impacts to caves used by the Ozark big-eared bat, it seems unlikely that the project would affect this bat. It is concluded the Ozark big-eared bat would not be affected by construction, operation, maintenance, and abandonment of the project in Oklahoma.

Harvey, et al. (1978) reviewed the status of this bat in Arkansas, but mentioned records for only Washington and Marion Counties. The Fish and Wildlife Service (1980a) additionally reported the Ozark big-eared bat from Crawford, Madison, and Newton Counties. Crawford County would be traversed by the Market Alternative and Proposed Action. Lowman (1975) reported the Ozark big-eared bat from Bluff Dweller's Cave and Mulberry in Crawford County. Although the Ozark big-eared bat could occur as a migrant along the pipeline corridor, hibernacula would not be affected. Since the major concern regarding protected bats would be the potential disturbance of hibernating or maternity colonies, the Ozark big-eared bat would not be affected by construction, operation, maintenance, and abandonment of the project.

Florida Panther

Numerous sightings of Florida panthers (Felis concolor coryi) have occurred in Arkansas. Sealander and Gipson (1973) reported small puma populations near the Saline and Ouachita River bottomlands in southeastern

Arkansas, in the White River National Wildlife Refuge near the confluence of the White and Arkansas Rivers, in the western Ozark Mountains north of the Arkansas River, and in the Ouachita Mountains in west-central Arkansas south of the Arkansas River. In 1949 an adult Florida panther was killed near Sims, Montgomery County, Arkansas (Lowery 1974a). A second panther was killed east of Hamburg, Ashley County, Arkansas, in 1969 (Lowery 1974a). The more recent sightings in recent years indicate the panther is holding its own in Arkansas and population levels may be rising (Sealander and Gipson 1973). Most recent lion sightings have occurred in southeastern Arkansas. Southeastern Arkansas has the state's highest deer concentration.

In Louisiana, puma sightings have occurred recently in Natchitoches (St. Ament 1959; Goertz and Abegg 1966), Madison, Webster, St. Tammany, Concordia, Catahoula, and East Baton Rouge Parishes (Lowery 1974). A puma was killed near Keithville, Caddo Parish on November 30, 1965 (Lowery 1974).

The Florida panther's occurrence in areas containing components of the ETSI pipeline project is mostly a conjectural matter and consequently, the Florida panther would not be affected by construction, operation, maintenance, and abandonment of the project.

Red Wolf

The recent range of the red wolf in Louisiana is roughly the southwestern corner of the state encompassing the area south of Interstate Highway 10 and west of Calcasieu Lake. Generally this area includes the western half of Cameron Parish and the southwestern quarter of Calcasieu Parish (Carley 1979). According to Carley (1979) the Red Wolf Recovery Program field activities in the final range of the species in southwestern Louisiana and southeastern Texas will be concluded in the fall of 1980, due to the impracticality of attempting to capture the few red wolves that may remain. Carley concluded that for all practical purposes, the red wolf will then be extinct in the wild.

The ETSI coal slurry pipeline project would terminate at the Lake Charles site. The Lake Charles site would be located approximately 16 miles north of Calcasieu Lake and would be separated from the red wolves' suspected range by the City of Lake Charles. The red wolf would not be affected by construction, operation, maintenance, and abandonment of the project.

3.A.2 BIRDS

The federally listed species discussed here are bald eagle, peregrine falcon, whooping crane, Eskimo curlew, Bachman's warbler, red-cockaded woodpecker, and ivory-billed woodpecker. It is the opinion here that a "may affect" exists for the bald eagle, whooping crane, and red-cockaded woodpecker; it is the opinion here that the peregrine falcon, Eskimo curlew, Bachman's warbler, and ivory-billed woodpecker will not be affected by the construction, operation, maintenance, and abandonment of the ETSI coal slurry pipeline project.

Bald Eagle

No bald eagles are known to nest near the route, but overwintering bald eagles may be encountered, particularly in the vicinity of major river crossings (National Wildlife Federation 1979; 1980). All states traversed by the alignments have known populations of wintering bald eagles. Most of these birds are located near large rivers, reservoirs, or lakes.

Major rivers where bald eagles could be encountered during winter include the North Platte in Wyoming; the South Platte in Colorado; the Cheyenne River and Lake Oahe in South Dakota; the North Platte, South Platte, and Republican Rivers in Nebraska; the South Fork Republican and the Arkansas River in Kansas; the Neosho, Salt Fork of the Arkansas, and Arkansas Rivers in Oklahoma; and the Arkansas River in Arkansas. Only one specific location was identified of known concern, the crossing of

the Arkansas River near Ponca City on the Proposed Action route (MP 720). Three years of data has demonstrated the abundance of overwintering eagles in this area (Short 1980). Large cottonwood timber along this fairly shallow and clear river has made it a prime bald eagle wintering area (Short 1980). If large roost trees (see Sprunt 1972) are destroyed in crossing these rivers a "may affect" from construction would exist for bald eagles. The bald eagle would not be affected by operation, maintenance, and abandonment of the project.

Peregrine Falcon

The peregrine falcon was probably always rare in Wyoming due to limited suitable habitat (Clark and Dorn 1979). The peregrine occurs most frequently as a migrant through Wyoming although it may breed in the western portion of the state. Enderson (1969) in a 1964-1965 survey estimated approximately 25 breeding pairs of peregrines in Wyoming and Colorado. Human disturbance at eyries is a serious factor particularly in western states (Snow 1972b). Peregrines could appear infrequently in areas of eastern Wyoming which would be affected by components of the ETSI coal slurry pipeline project and since no eyries are known in the vicinity of the project, the peregrine falcon would not be affected by construction, operation, maintenance, and abandonment of the project in Wyoming.

Prior to the 1950s few peregrine falcon eyries were known in Colorado but in 1978, 31 active eyries were recorded (Colorado Division of Wildlife 1978). The majority of the sites presently occupied are situated in mountainous localities. All 31 sites recorded by the Colorado Division of Wildlife (1978) were located in the central and western portions of the state. The eastern range limit of the peregrine hunting and nesting areas in Colorado contain portions of Larimer, Boulder, Jefferson, and El Paso Counties (Colorado Division of Wildlife 1978).

The Colorado Alternative route through Colorado would traverse portions of Weld, Logan, Washington, and Yuma Counties in the northeastern portion of the state. Although peregrines may occasionally occur in these counties there are no eyries in that portion of the state (Colorado Division of Wildlife 1978). Since components of the ETSI coal slurry pipeline project would not be located near known peregrine eyries in Colorado, the peregrine falcon would not be affected by construction, operation, maintenance, or abandonment of the project in Colorado.

The only known record of peregrine nesting in Nebraska occurred in 1903 in Dawes County. According to the Nebraska Game and Parks Commission (1977) the peregrine occurs in Nebraska as a rare fall migrant and a rare winter resident. Peregrine falcon eyries are not known to occur in portions of Nebraska containing components of the ETSI coal slurry pipeline project and, consequently, the peregrine falcon would not be affected by construction, operation, maintenance, or abandonment of the project in Nebraska.

There are no known records of nesting peregrine falcons in Kansas during this century (American Peregrine Falcon Recovery Team 1977). According to Platt, et al. (1974), the peregrine falcon occurs in Kansas as a fall and spring migrant and a winter resident. Typically sightings occur around marshes, lakes, and rivers. It's unlikely that construction, operation, maintenance, or abandonment of components of the ETSI coal slurry pipeline project would affect the peregrine falcon in Kansas.

Chamberlain (1974) reported that the peregrine falcon breeds sparingly in western Oklahoma and occurs in eastern Oklahoma only as an occasional winter visitor. Seldom are more than a few birds reported in eastern Oklahoma in any one year. Eastern records include sightings near Washita National Wildlife Refuge, Hulah Reservoir, and Stillwater (Chamberlain 1974).

Arkansas records suggest the peregrine is a rare fall and winter visitor in that state. Chamberlain reported recent records from Lonoke, Magazine Mountain, and Union County. The last record of nesting activity in Arkansas occurred in 1888 (Arkansas Department of Planning 1974).

Louisiana sightings occur most frequently in coastal areas although Chamberlain suggested the peregrine is a rare winter resident in scattered locations in the state. Lowery (1974b) reported peregrine records from Louisiana occur from early September through mid-May. The only known breeding record in the state occurred in 1942 near Tallulah in Madison Parish (Gulf South Research Institute 1976).

In the portions of Oklahoma, Arkansas, and Louisiana which would contain project components of the ETSI coal slurry pipeline peregrine eyries are not known to occur. The peregrine falcon would not be affected by construction, operation, maintenance, or abandonment of the project in these states.

Whooping Crane

The whooping crane is a regular spring and fall visitor in South Dakota. Observations of whooping cranes have been reported from the prairie edges of the Black Hills to near the eastern border of South Dakota (Anderson 1980). However, most sightings occur within a north-south corridor 100 miles east and 150 miles west of Pierre. Approximately 170 miles of the Oahe Alternative would cross the whooping crane's migrating corridor through South Dakota.

According to Anderson (1980) whooping cranes are present in South Dakota from 6 to 7 April through May and from early September through the first 10 days of November. There is some data which suggests that the whooping crane may have used the Cheyenne River as a staging area about 15 years ago (Anderson 1980).

Presently, whooping cranes are not known to occur on rivers and streams which would be traversed by the Oahe Alternative. Whooping cranes would not be affected by construction, operation, maintenance, or abandonment of components of the ETSI coal slurry pipeline project in South Dakota.

In Wyoming Clark and Dorn (1979) considered the whooping crane an occasional migrant through the eastern and western thirds of the state, although it is more frequent in the western portion. Whooping cranes have historically occurred in eastern Colorado as accidental migrants (Colorado Division of Wildlife 1978). The main migration corridor is east of Colorado. The most recent Colorado sighting of migrating whooping cranes was made in November 1973 in the Greeley area of Weld County (Colorado Division of Wildlife 1978).

The Fish and Wildlife Service is using sandhill cranes to raise whooping crane chicks at Gray's Lake, Idaho. They have been successful in establishing a migrating population of cranes which winter in the Bosque del Apache Refuge in southern New Mexico. The migratory corridor used by these cranes includes much of western Colorado (Colorado Division of Wildlife 1978). An important staging area is located at the Monte Vista National Wildlife Refuge in Rio Grande County. Rio Grande County is approximately 220 miles southwest of the Coloardo Alternative in Colorado.

Components of the ETSI coal slurry pipeline project located in eastern Wyoming and northeastern Colorado would not be located in the regular migratory corridor of the whooping crane. Staging areas are not known to occur near component locations. The whooping crane would not be affected by construction, operation, maintenance, or abandonment of the proposed project.

The whooping crane occurs in Nebraska only as a migrant during the fall and spring (Nebraska Game and Parks Commission 1977). While in

Nebraska, they utilize sandbars on the Platte and Niobrara Rivers, and wetlands and croplands for roosting, resting, and feeding. In May 1978 the Fish and Wildlife Service designated the area of the Platte River from Lexington to Denman, Nebraska (approximately 53 river miles) as critical habitat for the whooping crane (Federal Register 43(94)-May 1978).

Components of the Proposed Action/Market Alternative through Nebraska would traverse the North Platte and South Platte Rivers prior to their confluence forming the Platte River. The North Platte would be traversed near Broadwater and the South Platte near Ogollala, Nebraska. Both crossings occur approximately 80 miles upstream of the cranes critical habitat. Construction required to traverse the North and South Platte Rivers would occur in August and September 1983. Whooping cranes would not be present on the Platte River during this period. Since project components would not occur near the staging areas on the South Platte and North Platte Rivers the whooping crane would not be affected by construction, operation, maintenance, or abandonment of the proposed project in Nebraska.

In Kansas the whooping crane occurs only as a transient visitor during March, April, and October (Platte, et al. 1974). Cheyenne Bottoms State Waterfowl Refuge in Barton County, Kansas is designated as critical habitat for migrating whooping cranes. Two components of the pipeline project would occur in Barton County. The Proposed Action would traverse the southwestern corner of Barton County approximately 16 miles southeast of the refuge and the Colorado Alternative would run approximately 10 miles north of the refuge. Queal and Wood (1980) indicated that at this distance, the whooping cranes would not be disturbed by pipeline construction. However, concern exists that a slurry spill in Deception Creek would severely affect Cheyenne Bottoms and consequently the whooping cranes critical habitat (Queal and Wood 1980). The Colorado Alternative would cross Deception Creek at MP 557 in Barton County, Kansas. A major rupture in Deception Creek could

cause a reduction in suitable whooping crane habitat in Cheyenne Bottoms. If the Colorado Alternative is chosen, the potential exists for whooping cranes to be affected by a spill from the ETSI coal slurry pipeline project in Kansas. The whooping crane would not be affected by construction, operation, maintenance, or abandonment of the project in Kansas.

In Oklahoma the whooping crane appears as a transient visitor in the eastern two-thirds of the state. Salt Plains National Wildlife Refuge in Alfalfa County has been declared as critical habitat for the whooping crane. Alfalfa County is located approximately 60 miles west of the Proposed Action route. Migrating birds could pass over construction sites but no impact would be anticipated from construction, operation, maintenance, or abandonment of the proposed project in Oklahoma.

In Louisiana the last whooping crane reported was in 1950 (Lowery 1974b) near White Lake, Vermilion Parish in the coastal wetlands area. The whooping crane would not be affected by construction, operation, maintenance, or abandonment of the coal slurry pipeline project in Louisiana.

Eskimo Curlew

No recent sightings of this migratory species exist within the states containing project components. The last sighting in Wyoming was in 1897 (Clark and Dorn 1979); in Kansas the last sighting was in 1891 (Platt, et al. 1974); the last sighting in Nebraska was in 1926 (Nebraska Game and Parks Commission 1977); and the last sighting in Louisiana was in 1964 (Lowery 1974b). The most recent record, which falls outside the project area, was at James Bay, Ontario in 1976 (Fish and Wildlife Service 1980a). Since this species never bred or wintered in the project area, it would not be affected by construction, operation, maintenance, or abandonment of the coal slurry pipeline project.

Bachman's Warbler

Most authorities agree that if Bachman's warbler still exists it is most likely in the I'On Swamp area in South Carolina. There are no confirmed nesting sites for this species in any of the subject states within this century (Fish and Wildlife Service 1980a). Bachman's warbler would not be affected by construction, operation, maintenance, or abandonment of the proposed project.

Red-cockaded Woodpecker

The proposed pipeline alignments do not traverse known red-cockaded woodpecker distribution range in Oklahoma (Red-cockaded Woodpecker Recovery Team 1979). The Proposed Action route in both Arkansas and Louisiana would traverse through or near areas reported to have red-cockaded woodpeckers. Known colonies would occur between MP 1060 to 1070 (Barkley, et al. 1980; James and Burnside 1979) and MP 1160 to 1170 (Smith 1980) in Arkansas. The red-cockaded woodpecker could be encountered along the alignment in Arkansas from about MP 1060 to 1175; and in Louisiana from MP 1240 to 1245, and MP 1255 to 1275 (Dunham 1980).

Construction of the pipeline through mature, open pine forests could result in the loss of suitable red-cockaded woodpecker habitat as well as destroy active colonies. In addition, if construction activity occurred during the nesting season (April and May), adult birds might abandon active nests. The potential for a significant long-term impact exists from construction activities for the red-cockaded woodpecker. If any mature pine woods were traversed along portions of the alignment detailed above a "may affect" will exist for the red-cockaded woodpecker until appropriate surveys have been completed. The red-cockaded woodpecker would not be affected by operation, maintenance, or abandonment of the project.

Ivory-billed Woodpecker

Most authorities agree this woodpecker is now extinct but during the late 1960s and early 1970s there were unconfirmed sightings from the

"Big Thicket" area of east Texas and from southern Louisiana (Fish and Wildlife Service 1980a). The ivory-billed woodpecker would not be affected by construction, operation, maintenance, or abandonment of the proposed project.

3.A.3 REPTILES AND AMPHIBIANS

The only federally listed amphibian or reptile which appeared on the Fish and Wildlife Service's Section 7 list is the American alligator (Appendix Table A2). It is the opinion here that a "may affect" from construction and operation exists for the American alligator.

American Alligator

The American alligator could be encountered in southeastern Arkansas and along most of the Proposed Action route in Louisiana where the alignments would traverse areas near and including river systems, canals, lakes, swamps, bayous, and coastal marshes. If any nests were destroyed during construction an impact would occur to those individuals (the nest is built about the first part of June; hatching usually occurs from the last part of July to mid-August, but may extend into late August or early September). Construction in these areas is scheduled for February through October 1984. Since alligator nests could be destroyed during construction it is necessary to consider that a "may affect" impact exists. However, because of the increase in population of alligators in Louisiana (Fish and Wildlife Service 1980a), and to some extent in Arkansas, the impact from destroying a small number of eggs or hatchlings relative to the existing alligator population would not be significant. The alligator could also be affected in isolated locations if a spill occurred. The American alligator would not be affected by operation, maintenance, or abandonment of the project.

3.A.4 FISHES

Project components of the ETSI coal slurry pipeline would not approach the known habitat of federal endangered, threatened, proposed or notice of review fishes (Appendix Table A2). Consequently, none of the federal fish species which occur in states containing project components are discussed in this report.

3.A.5 INVERTEBRATES

The invertebrates discussed here are two mussel species under consideration for federal listing (Neosho pearly mussel and Wheeler's pearly mussel) and the federally endangered fat pocketbook pearly mussel. It is the opinion here that a "may affect" exists for the Neosho pearly mussel and Wheeler's pearly mussel. It is the opinion here that no impact would occur to the fat pocketbook pearly mussel.

Neosho Pearly Mussel

The only potential project effects on the Neosho pearly mussel would be associated with stream crossing construction and/or slurry spills, and would be limited to those stream locations where the pipeline right-of-way coincides with this mussel's current distribution. Since freshwater mussels live in or upon stream bottom substrates there is a possibility that mussels would be removed from the streambed during pipeline construction and disposed with the dredge spoil which would, of course, kill them. Additionally, degraded water quality and sedimentation effects potentially resulting from spills could smother, stress, or kill mussels located at or immediately downstream from the spill site. It is anticipated that these potential impacts would be localized.

A review of the current Neosho pearly mussel distribution data cited above indicates that there are four potential locations where

pipeline construction may coincide with this mussel's distribution, as presented below.

Project Component	River	Approximate MP	County and State
Market Alternative	Neosho	409	Mayes Co., OK
	Illinois	436	Cherokee Co., OK
Proposed Action	Neosho	839	Muskogee Co., OK
	Illinois	865.5	Sequoyah Co., OK

The project construction schedule suggests that these river crossings would probably be constructed in 1983. If, as Chambers (1980) suggests, this species is listed and its critical habitat designated in fiscal year 1981, at that time it will be possible to more accurately determine those specific locations where the Fish and Wildlife Service is concerned about potential impact. In summary, the Neosho pearly mussel could be affected by construction and operation, but would not be affected by operation, maintenance, or abandonment of the project.

Wheeler's Pearly Mussel

The only potential project effects on Wheeler's pearly mussel would be associated with stream crossing construction and/or slurry spills, and would be limited to those stream locations where the pipeline right-of-way coincides with this mussel's current distribution. Since freshwater mussels live in or upon stream bottom substrates there is a possibility that mussels would be removed from the streambed during pipeline construction and disposed with the dredge spoil which would, of course, kill them. Additionally, degraded water quality and sedimentation effects potentially resulting from spills could smother, stress, or kill mussels located at or immediately downstream from the spill site. It is anticipated that these potential impacts would be localized.

A review of the current Wheeler's pearly mussel distribution data cited above indicates that the Proposed Action crossing of the Arkansas

River (MP 720, Osage County, Oklahoma) is the only suspected location where the pipeline may coincide with this mussel's distribution.

The project construction schedule indicates that the Arkansas River would be crossed in August or September 1983. If, as Chambers (1980) suggests, this species is listed and its critical habitat designated in fiscal year 1981, at that time it will be possible to more accurately determine those specific locations where the Fish and Wildlife Service is concerned about potential impact. In summary, Wheeler's pearly mussel could be affected by construction and operation, but would not be affected by maintenance and abandonment of the project.

Fat Pocketbook Pearly Mussel

Both historical and recent data indicated that the fat pocketbook pearly mussel is indigenous to the White and St. Francis basins in Arkansas. These same data, however, indicate that this mussel is a large river species (Army Corps of Engineers 1979; Starrett 1971; Parmalee 1967). To date, this mussel has not been reported from ephemeral streams, intermittent streams, or small and medium-sized perennial streams. Therefore, the only river crossing location where this mussel may be expected to occur would be the White River crossing of the Independence Lateral portion of the Proposed Action route (MP 92.5). A recent mussel survey at that location in 1977, however, revealed no living specimens, fossilar or sub-fossilar shells, or even suitable substrate (Environmental Protection Agency 1978). Construction, operation, maintenance, or abandonment of the pipeline project is not anticipated to affect the fat pocketbook pearly mussel.

3.A.6 PLANTS

The Colorado butterfly-weed (see Section 2.A.6) may occur along the Colorado Alternative. Since this plant is expected to be listed as federally endangered or threatened in December 1980 destruction of plants during construction would be considered an effect. Further details of potential occurrence would be needed.

3.B STATE SPECIES

3.B.1 MAMMALS

The only state listed species discussed here is the northern swift fox. It is the opinion here that a "may affect" exists for the northern swift fox in South Dakota. The swift fox would not be significantly affected in Nebraska.

Northern Swift Fox

The northern swift fox is a state threatened species in South Dakota and a state endangered species in Nebraska. The swift fox has been recently sighted near two locations of the proposed Oahe Alternative in South Dakota, near MP 38 in Stanley County, and south of MP 60 in Haakon County (Sharps 1980). Location of dens has not been identified. The swift fox occurs in areas traversed by the Proposed Action/Market Alternative in northwestern Nebraska, particularly between MP 120 to 130 (Nebraska Game and Parks Commission 1980). At this location in Nebraska the route would pass near denning sites of the northern swift fox (Carlson 1980).

Kilgore (1967) reported that swift fox abandon dens, particularly those in which young are being reared, as the result of increased human activity in an area. Construction is scheduled for early July 1984 in the sections of Nebraska of concern. Kilgore (1967) found swift fox young nearly full grown by mid-July. Consequently, the chances of destroying a young swift fox in this area are very low. However, displacement could occur if dens were disturbed. In South Dakota, the chance exists that a female and/or her young could be destroyed by trenching equipment; or abandonment of young may occur. The loss of individual swift fox in South Dakota would be a significant impact.

3.B.2 BIRDS

The state listed species discussed here are the interior least tern and the greater prairie chicken. It is the opinion here that a "may affect" exists for both these species.

Interior Least Tern

The interior least tern is a state endangered species in South Dakota, and a state threatened species in Nebraska and Kansas. It nests on river sandbars, sandflats, and other similar habitat in June and July (South Dakota Ornithologists Union 1978). No recent nesting records of the least tern exist in portions of South Dakota which would contain Oahe alternative components (South Dakota Ornithologists Union 1978), and consequently, no impact is anticipated in South Dakota.

In Nebraska nesting colonies of the interior least tern are known to occur on certain portions of the Platte River east of central Lincoln County, Nebraska (Nebraska Game and Parks Commission 1977). Since the Proposed Action/Market Alternative would cross the Platte River in eastern Keith County, well west of these known nesting colonies, the least tern would not be affected.

Platt, et al. (1974) lists the least tern as a summer resident in Kansas. Breeding least terns have been reported in Rooks, Barton, and Stafford Counties, all of which would be traversed by the Proposed Action. The Arkansas River is scheduled for crossing during August and September 1984; the South Fork of the Salomon River would be traversed in early February 1984. Since crossings at these locations would not coincide with interior least tern nesting, no impact would occur. Rattlesnake Creek would be crossed in late May or early June 1984. Terns could be nesting at the crossing during this time. Some nests could be destroyed while other nests in the vicinity of the crossing may be abandoned.

Greater Prairie Chicken

In Colorado, between about MP 315 to 325 of the Colorado Alternative (northwest of Wray) there is concern for a remnant population of greater prairie chickens. If the alignment passes through a strutting ground, such areas (strutting grounds) could be permanently abandoned (Colorado Division of Wildlife 1980). Since the greater prairie chicken is listed as endangered by Colorado this loss of strutting grounds would result in a long-term significant impact to the greater prairie chicken. In addition, maintenance activities such as vehicular traffic or brush clearing along the corridor could affect the greater prairie chicken. The greater prairie chicken would not be affected by operation or abandonment of the project in Colorado.

In Oklahoma, the greater prairie chicken is considered a sensitive species (Gomez 1979), but has no protected species status. Range of the prairie chicken may be encountered between about MP 690 to 718 of the Proposed Action, about MP 810 to 825 of the Proposed Action, and about MP 324 to 337 of the Market Alternative. In addition the Proposed Action would continue across excellent quality tall-grass prairie between about MP 740 to 745. This is the best prairie chicken habitat containing project components in Oklahoma (Short 1980) even though some of it is not occupied at present.

Pipeline construction in these areas would not coincide with the April and May breeding activity of these birds. However, strutting grounds could be altered temporarily. Temporary loss of strutting grounds would not significantly affect the prairie chicken in Oklahoma.

3.B.3 REPTILES AND AMPHIBIANS

No additional species are discussed here.

3.B.4 FISHES

The state listed species discussed here are the northern redbelly dace, finescale dace, sturgeon chub, longnose sucker, plains orange-throat darter, Topeka shiner, and Arkansas darter. It is the opinion here that a "may affect" exists for these species.

Northern Redbelly Dace

According to Scalet (1980) the northern redbelly dace is present in the Big Sioux, Niobrara, Minnesota, and Crow Creek drainage basins in South Dakota. It prefers spring-fed streams and could be present in Crow Creek at the proposed Oahe Alternative crossing (MP 188.5). If the northern redbelly dace is present in Crow Creek it could be affected by construction. Sedimentation and increased turbidity may cause some individuals to be temporarily displaced. During the spawning season (spring to early summer) some egg mortality could occur. However, the population would be expected to recover to pre-construction levels in a few years.

This species would not be significantly affected by small leaks in the pipeline. If a major spill occurred, the northern redbelly dace could be significantly affected by habitat alteration and siltation. Depending on the size of the spill and flow volumes at the time, toxic compounds released from the spill site could have a significant impact on the species.

Fuel spill hazards exist at every stream crossing. However, ETSI will take precautions so that petrochemical spills do not occur. With supervised careful handling, petrochemical spills should not be a significant concern.

The northern redbelly dace could be affected by construction and operation of the Oahe Alternative pipeline. However, standard pipeline

construction procedures and normal pipeline operation would result in localized short-term impacts and, depending on the construction period in the drainage, would probably be insignificant.

Finescale Dace

Finescale dace were collected from four locations in South Dakota by Bailey and Allum (1962):

- Mirror Lake, tributary to Beaver (Crow Creek, 9 mi NW Spearfish, T.7N, R.1E, Section 20. Lawrence County).
- Mud Lake, 8 mi NW Spearfish, T.7N, R.1E, Section 16. SE 1/4, Lawrence County.
- Redwater Creek, at mouth of Crow (or Beaver) Creek, 9 mi W Spearfish, T.7N, R.1E, Section 16. NW 1/4, Lawrence County.
- Cox Lake, 8 mi NW Spearfish, T.7N, E.1E, Section 16. SE 1/4, Lawrence County.

Redwater Creek would be traversed by the Oahe Alternative at approximately MP 188.5. In Redwater Creek the finescale dace could be affected by construction. Sedimentation and increased turbidity may cause some individuals to be temporarily displaced. During the spawning season (spring) some egg mortality could occur. However, the population would be expected to recover to pre-construction levels in a few years.

Small leaks in the pipeline would not significantly impact this species. If a major spill occurred, the finescale dace could be significantly affected by habitat alteration and siltation. Depending on the size of the spill and flow volumes at the time, toxic compounds released from the spill site could have a significant effect on the species.

Fuel spill hazards exist at every stream crossing. However, ETSI will take precautions so that petrochemical spills do not occur. With supervised careful handling, petrochemical spills should not be a significant concern.

The finescale dace could be affected by construction and operation of the Oahe Alternative. However, standard pipeline construction procedures and normal pipeline operation would result in localized, short-term impacts and, depending on the construction period in the drainage, would probably be insignificant.

Sturgeon Chub

Bailey and Allum (1962) collected sturgeon chubs from the section of the Cheyenne River which would be crossed by the Oahe Alternative. The Cheyenne River would be traversed at approximately MP 103 in Pennington County. The sturgeon chub spawns in May and June in Kansas (Cross and Collins 1975). In South Dakota spawning probably occurs a few weeks later.

The sturgeon chub has highly specialized morphological adaptations which allow it to live in swift turbid waters (Moore 1950). Its preferred habitat is swift gravelly riffles (Pflieger 1975).

According to Stewart and Thilenius (1964) the Cheyenne River is heavily silted. Because of the rivers large size and heavy silt load, impacts resulting from construction related stream siltation and flow regime alteration would be localized and short-term. Habitat alteration from pipeline construction would also be localized. If construction occurred during the sturgeon chubs spawning period (mid-May to mid-June) a few eggs could be lost in the area immediately downstream of the 100 foot right-of-way.

A pipeline rupture could occur in the Cheyenne River although the chances of such a rupture are remote. The toxic components of a small

leak would be quickly diluted and would have no serious impact on the sturgeon chub. A large spill would also be diluted but there could be short-term, localized water quality degradation. Such a spill may cause a local population of sturgeon chubs to abandon the area. There would be some sedimentation effects associated with a large rupture which could make the habitat immediately downstream of the spill site unsuitable for the sturgeon chub.

Fuel spill hazards exist at every stream crossing. However, ETSI will take precautions so that petrochemical spills do not occur. With supervised careful handling, petrochemical spills should not be a significant concern.

The sturgeon chub could be affected by construction and operation of the Oahe Alternative. However, standard pipeline construction procedures and normal pipeline operation would result in localized short-term impacts and, depending on the construction period in the drainage, would probably be insignificant.

Longnose Sucker

Apparently, the longnose sucker is restricted in South Dakota to a small area, well supplied with cool, spring-fed creeks, lying north of the Black Hills in the Belle Fourche River drainage of the Cheyenne River system. Bailey and Allum (1962) collected longnose suckers from the following South Dakota locations:

- Redwater Creek, at mouth of Crow (or Beaver) Creek, 9 mi W Spearfish, T.7N, R.1E, Section 16, NW 1/4, Lawrence County.

- Spearfish Creek, 2 mi NNW Spearfish, at junctions of Hwys. 14 and 85, Lawrence County.

- Belle Fourche Lake (Orman Lake), near south end of dam, T.9N, R.4E, Section 19, Butte County.

Redwater Creek and Spearfish Creek would be traversed at MP 188.5 and 188, respectively, by the Oahe Alternative.

The longnose sucker could be affected by construction. Sedimentation and increased turbidity may cause some individuals to be temporarily displaced. During the spawning season (mid-April to mid-May) some egg mortality could occur if construction occurred in the basin. However, the population would be expected to recover to pre-construction levels in a few years.

Small leaks in the pipeline would not significantly impact this species. If a major spill occurred, the longnose sucker could be significantly affected by habitat alteration and siltation. Depending on the size of the spill and flow volumes at the time, toxic compounds released from the spill site could have a significant effect on the species.

Fuel spill hazards exist at every stream crossing. However, ETSI will take precautions so that petrochemical spills do not occur. With supervised careful handling, petrochemical spills should not be a significant concern.

The longnose sucker could be affected by construction and operation of the Oahe Alternative. However, standard pipeline construction procedures and normal pipeline operation would result in localized, short-term effects and, depending on the construction period in the drainage, would probably be insignificant.

Plains Orangethroat Darter

According to the Colorado Division of Wildlife (1978) plains orangechroat darters have been found throughout the South Fork Republican River drainage, in the Arikaree River near Highway 385, and in the North Fork Republican River above and below Wray. The Colorado Alternative would cross the North Fork Republican River at MP 331.5 (above

Wray) in Yuma County, Colorado. The plains orangethroat darter also occurs in Chief Creek, a major tributary to the North Fork. Chief Creek would be traversed at MP 328.5 in Yuma County. The Arikaree River would be crossed at MP 347 in Yuma County near the Colorado-Kansas state line. In Colorado, the South Fork Republican River basin would not contain components of the Colorado Alternative.

The plains orangethroat darter spawns in May and June when water temperatures reach 60° to 70°F (Colorado Division of Wildlife 1978). Apparently this darter is particularly susceptible to siltation. Stream siltation resulting from construction of the pipeline through streams containing plains orangethroat darters could reduce the reproductive success of this species. Construction activities during May and June could result in a local loss of darter eggs downstream from the construction site. The loss of a few darter eggs would be considered a short-term impact even though the fishes year-class strength would be temporarily reduced. Depending on the number of eggs lost, the population would be expected to return to pre-construction levels in a few years.

Depending on the precise stream section which would be crossed, habitat alteration could result in a lowered carrying capacity and consequently the standing crop of darters in the stream could be reduced.

The effects of a small, low volume pipeline leak on the orangethroat darter would probably be short-term and localized. Such a leak would be diluted quickly enough to avoid significant effects downstream from the spill site. The small amount of sediment leached from a small leak would be inconsequential. A large rupture or break in the pipeline could create long-term impacts to darters in streams similar to Chief Creek. A pipeline break in Chief Creek could cause localized permanent loss of darter habitat downstream from the spill site.

With the low volumes of water characteristic of Chief Creek, dilution of the spilled slurry and its toxic components would occur slowly. Degraded water quality could affect significant portions of the downstream area.

Fuel spill hazards exist at every stream crossing. However, ETSI will take precautions so that petrochemical spills do not occur. With supervised careful handling, petrochemical spills should not be a significant concern.

The plains orangethroat darter could be affected by construction and operation of the Colorado Alternative. However, standard pipeline construction procedures and normal pipeline operation would result in short-term impacts and, depending on the construction period in the drainage, would probably be insignificant.

Topeka Shiner

According to information provided by Cross and Collins (1975) the Topeka shiner occurs in Cherry Creek in Cheyenne County, Kansas. Cherry Creek would be crossed in Cheyenne County by the Colorado Alternative at MP 364.5.

The Topeka shiner could be affected by construction, operation, maintenance, and abandonment of the pipeline project if the Colorado Alternative route is chosen. Components of the Market Alternative and Proposed Action would not affect the Topeka shiner in Kansas.

Pipeline construction through Cherry Creek may affect the Topeka shiner. Associated impacts could result from stream siltation, fuel spill hazards, flow regime alteration and habitat alteration (Rogozen, et al. 1977; Anderson, et al. 1978; and the Environmental Protection Agency 1976). Impacts associated with pipeline construction are expected to be short-term. The Topeka shiner would likely not be affected if the sections of Cherry Creek which would be traversed were dry during the construction period.

Perhaps the most notable impact which could result from construction in the Cherry Creek drainage would be the potential reduction in the reproductive success of the Topeka shiner. Meehan and Swanston (1977) and Auld and Schubel (1978) found that varying amounts of suspended sediments affected the hatching success of fish eggs. If construction occurred during spawning (June to August) some eggs may be lost due to siltation.

As with all stream crossings, the potential exists for the spill of petrochemicals into Cherry Creek. ETSI will take all necessary precautions to insure the careful handling of such materials and consequently, no significant spills of petrochemicals should occur.

Adult Topeka shiners are not expected to be significantly affected by pipeline construction. Areas of increased turbidity are usually avoided by adult fishes (Peters 1967) and would probably be promptly recolonized when the turbidity levels were reduced.

At each stream crossing the potential exists for a pipeline rupture. Although the chances for such a rupture are remote, if such a spill occurred, there would be some short-term water quality effects. The severity of toxic impacts would depend on the stream conditions, water quality characteristics and volume of the spill. If a small leak occurred during high stream flow, any toxic characteristics of the spill would soon be diluted. If a small leak occurred during Cherry Creek's intermittent flow period, isolated pools containing Topeka shiners could serve as a catch basin for the spilled material. Such a spill, through cumulative effects, could impact isolated populations of Topeka shiners.

A major rupture in the slurry line could have more long-term impacts on the Topeka shiner. Such a rupture could cause significant water quality degradation, sedimentation, and habitat alteration.

The Topeka shiner could be affected by construction and operation of the Colorado Alternative pipeline. However, standard pipeline construction procedures and normal pipeline operation would result in localized, short-term impacts and, depending on the construction period in the drainage, would probably be insignificant.

Arkansas Darter

Cross and Collins (1975) reported collections of the Arkansas darter from most counties south of the Arkansas River in Kansas. This darter could occur in isolated populations wherever suitable habitat exists in the portion of Kansas south of the Arkansas River. This fish prefers small springs or seeps that are partly overgrown by watercress or other aquatic plants (Cross and Collins 1975). It also occurs in small prairie streams. The Arkansas darter seems to require shallow, clear water where there is not too much current and where aquatic vegetation or exposed willow roots provide cover (Cross and Collins 1975).

It is impossible to determine the number of streams which would be traversed by the Proposed Action south of the Arkansas River which contain suitable habitat for the Arkansas darter because of specialized habitat requirements. Recent stream surveys collected the Arkansas darter from nine locations in Kansas (Kansas Department of Health and Environment 1978).

Four of those locations occur near components of the ETSI coal slurry pipeline system. A sizable population of Arkansas darters is known to occur in Rattlesnake Creek both upstream and downstream of the Proposed Action crossing in Stafford County (Kansas Fish and Game Commission 1978). A population of Arkansas darters occurs in Painter Creek, Kingman County, Kansas (Kansas Department of Health and Environment 1978). Painter Creek makes its confluence with the South Fork Ninnescah River approximately 5 miles upstream from the Proposed Action

crossing of the South Fork (MP 593) in Kingman County. The Painter Creek subbasin lies south of the South Fork Ninnescah while all pipeline components would be located north of the South Fork.

The third population is located in the South Fork Ninnescah River in Sedgwick County. The Proposed Action would traverse the South Fork Ninnescah River (MP 593) in Kingman County approximately 15 miles west of the Kingman-Sedgwick County line. The Proposed Action crossing would occur upstream of the reported Arkansas darter population.

The fourth known population of Arkansas darters near the pipeline project is located in the South Fork Ninnescah River in Pratt County. Again, the Kansas Department of Health and Environment (1978) did not reveal the precise location of that population. The Proposed Action would traverse the South Fork Ninnescah River at MP 593 in Kingman County, approximately 13 miles east of the Kingman-Pratt County line.

The Painter Creek and the South Fork Ninnescah River (Pratt County) Arkansas darter populations would not be affected by the pipeline project. Although the Painters Creek population occurs near the Proposed Action corridor, project components would not be located in the subbasin. The Arkansas darter population in the South Fork Ninnescah River in Pratt County occurs upstream from the Proposed Action crossing and therefore would not be affected.

The Rattlesnake Creek population may be affected by pipeline construction. Like most darters, the Arkansas darter is relatively intolerant to siltation. Siltation immediately downstream from the construction site could cause displacement of individuals in the immediate area. This displacement would be short-term and the area would be quickly recolonized. If construction occurs from March to May, sedimentation from construction could cause some local egg mortality. These losses, however, are believed to be short-term and the population would probably recover to pre-construction levels in a few years.

The toxic components released from a small pipeline leak in Rattlesnake Creek would probably be quickly diluted and would not affect the Arkansas darter. A severe pipeline rupture, however, would cause alterations in the fishes habitat, the stream flow regime, sedimentation impacts and possibly degraded water quality. A major spill could severly affect the Arkansas darter in Rattlesnake Creek.

The Arkansas darters occurring in the South Fork Ninnescah River in Sedgwick County, Kansas would not be affected by pipeline construction. The location is too far downstream from the proposed crossing to be affected by sedimentation. The toxic components of a small pipeline leak would probably be too dilute to have a significant impact on a population of darters over 15 miles downstream. A major rupture, however, could affect this population.

Fuel spill hazards exist at every stream crossing. However, ETSI will take precautions so that petrochemical spills do not occur. With supervised careful handling, petrochemical spills should not be a significant concern.

The Arkansas darter could be affected by construction and operation of the Proposed Action. However, standard pipeline construction procedures and normal pipeline operation would result in localized short-term impacts and, depending on the construction period in the drainage, would probably be insignificant.

3.B.5 INVERTEBRATES

No additional species are discussed here.

3.B.6 PLANTS

At the present time, endangered species legislation in states which would contain project components does not protect additional plant species.

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APPENDIX

Table A1. COMPREHENSIVE LIST OF FEDERAL AND STATE SENSITIVE SPECIES REVIEWED.

Taxa	Known Distribution Relative to Project	Federal Status						State Status			Impact	
		Endangered	Threatened	Threatened by Similarity of Appearance	Proposed	Notice of Review	Status Review	Endangered	Threatened	Under State Review	May Affect	No Anticipated Effect
MAMMALS												
*Black-footed ferret	South Dakota	X						X			X	
Mustela nigripes	Wyoming	X						X			X	
	Colorado	X						X			X	
	Nebraska	X						X			X	
	Kansas	X						X			X	
	Oklahoma	X										X
Grizzly bear	Wyoming		X						X			X
Ursus arctos	Colorado		X					X				X
Gray wolf	Wyoming	X						X				X
Canis lupus	Colorado	X						X				X
Gray Myotis	Kansas	X						X				X
Myotis grisescens	Oklahoma	X										X
	Arkansas	X										X
Indiana Myotis	Oklahoma	X										X
Myotis sodalis	Arkansas	X										X
Ozark big-eared bat	Oklahoma	X										X
Plecotus townsendii ingens	Arkansas	X										X
Florida panther	Oklahoma	X										X
Felis concolor coryi	Arkansas	X										X
	Louisiana	X										X
Red wolf	Louisiana	X										X
Canis rufus												
*Northern swift fox	South Dakota								X		X	
Vulpes velox	Nebraska							X			X	
River otter	South Dakota								X			X
Lutra canadensis	Colorado							X				X
Mountain lion	South Dakota								X			X
Felis concolor												
Black bear	South Dakota								X			X
Ursus americanus												
Spotted bat	Wyoming								X			X
Euderma maculatum												
Wolverine	Colorado							X				X
Gulo gulo												
Lynx	Colorado							X				X
Lynx canadensis												
Southern flying squirrel	Nebraska								X			X
Glaucomys volans												
BIRDS												
*Bald eagle	South Dakota	X						X			X	
Haliaeetus	Wyoming	X						X			X	
leucocephalus	Colorado	X						X			X	
	Nebraska	X						X			X	
	Kansas	X						X			X	
	Oklahoma	X									X	
	Arkansas	X									X	
	Louisiana	X									X	
Peregrine falcon	South Dakota	X						X				X
Falco peregrinus	Wyoming	X						X				X
	Colorado	X						X				X
	Nebraska	X						X				X
	Kansas	X						X				X
	Oklahoma	X										X
	Arkansas	X										X
	Louisiana	X										X
*Whooping crane	South Dakota	X						X				X
Grus americana	Wyoming	X						X				X
	Colorado	X						X				X
	Nebraska	X						X				X
	Kansas	X						X			X (spill only	
	Oklahoma	X										X
	Louisiana	X										X

Table A1. COMPREHENSIVE LIST (CONTINUED).

Taxa	Known Distribution Relative to Project	Federal Status: Endangered	Threatened	Threatened by Similarity of Appearance	Proposed	Notice of Review	Status Review	State Status: Endangered	Threatened	Under State Review	Impact: May Affect	No Anticipated Effect
Eskimo curlew	South Dakota	X						X				X
Numenius borealis	Wyoming	X						X				X
	Colorado	X						X				X
	Nebraska	X						X				X
	Kansas	X						X				X
	Oklahoma	X										X
	Arkansas	X										X
	Louisiana	X										X
*Red-cockaded woodpecker	Oklahoma	X										X
Picoides borealis	Arkansas	X									X	
	Louisiana	X									X	
Ivory-billed woodpecker	Arkansas	X										X
Campephilus principalis	Louisiana	X										X
Bachman's warbler	Arkansas	X										X
Vermivora bachmanii	Louisiana	X										X
Brown pelican	Louisiana	X										X
Pelecanus occidentalis												
*Interior least tern	South Dakota							X			X	
Sterna albifrons	Nebraska								X			X
athalassos	Kansas								X		X	
Osprey	South Dakota								X			X
Pandion haliaetus												
Buff-breasted sandpiper	South Dakota								X			X
Tryngites subruficollis												
*Greater prairie chicken	Colorado							X			X	
Tympanuchus cupido												
Prairie sharp-tailed grouse	Colorado							X				X
Pediocetes phasianellus jamesii												
Greater sandhill crane	Colorado							X				X
Grus canadensis tabida												
White pelican	Colorado								X			X
Pelecanus erythrorhynchos												
Lesser prairie chicken	Colorado								X			X
Tympanuchus pallidicinctus												
Mountain plover	Nebraska								X			X
Chardrius montanus												
Prairie falcon	Kansas								X			X
Falco mexicanus												
REPTILES AND AMPHIBIANS												
*American alligator	Oklahoma	X										X
Alligator	Arkansas	X									X	
mississippiensis	Louisiana	X	X	X							X	
Desert (Sonora) king snake	Oklahoma					X						X
Lampropeltis getulus getulus												
Blanding's turtle	South Dakota								X			X
Emydoidea blandingi												
False map turtle	South Dakota								X			X
Graptemys pseudogeographica												

Table A1. COMPREHENSIVE LIST (CONTINUED).

Taxa	Known Distribution Relative to Project	Federal Status: Endangered	Threatened	Threatened by Similarity of Appearance	Proposed	Notice of Review	Status Review	State Status: Endangered	Threatened	Under State Review	Impact: May Affect	No Anticipated Effect
Spiny softshell turtle *Trionyx spineferus*	South Dakota								X			X
Eastern hognose snake *Heterodon platyrhinos*	South Dakota								X			X
Lined snake *Tropidoclonion lineatum*	South Dakota								X			X
Brown snake *Storeria dekayi*	South Dakota								X			X
Northern red-bellied snake *Storeria occipitomaculata*	South Dakota								X			X
Mountain wood frog *Rana sylvatica*	Colorado								X			X
Alligator snapping turtle *Macroclemys temmincki*	Kansas								X			X
Central newt *Notophthalmus viridescens louisianensis*	Kansas							X				X
Grotto salamander *Typhlotriton spelaeus*	Kansas							X				X
Gray-bellied salamander *Eurycea multiplicata griseogaster*	Kansas							X				X
Cave salamander *Eurycea lucifuga*	Kansas							X				X
Northern crawfish frog *Rana aereolata circulosa*	Kansas									X		X
FISHES												
Kendall warm springs dace *Rhinichthys osculus thermalis*	Wyoming	X										X
Colorado squawfish *Ptychocheilus lucius*	Wyoming	X										X
	Colorado	X										X
Bonytail chub *Gila elegans*	Wyoming	X										X
	Colorado	X										X
Humpback chub *Gila cypha*	Colorado	X										X
Leopard darter *Percina pantherina*	Oklahoma	X										X
	Arkansas	X										X
Humpback (Razorback) sucker *Xyrauchen texanus*	Wyoming							X				X
	Colorado							X				X
* Northern redbelly dace *Phoxinus eos*	South Dakota								X		X	
	Nebraska								X			X
* Finescale dace *Phoxinus neogaeus*	South Dakota								X		X	
	Nebraska								X			X
Pearl dace *Semotilus margarita*	South Dakota							X				X
	Nebraska								X			X
* Sturgeon chub *Hybopsis gelida*	South Dakota								X		X	

Table A1. COMPREHENSIVE LIST (CONTINUED).

Taxa	Known Distribution Relative to Project	Federal Status: Endangered	Threatened	Threatened by Similarity of Appearance	Proposed	Notice of Review	Status Review	State Status: Endangered	Threatened	Under State Review	Impact: May Affect	No Anticipated Effect
Longnose sucker *Catostomus catostomus*	South Dakota								X		X	
Central mudminnow *Umbra limi*	South Dakota							X				X
Banded killifish *Fundulus diaphanus*	South Dakota							X				X
Pallid sturgeon *Scaphirhynchus albus*	South Dakota								X			X
	Nebraska								X			X
	Kansas							X				X
Sicklefin chub *Hybopsis meeki*	South Dakota								X			X
	Kansas							X				X
Trout-perch *Percopsis omiscomaycus*	South Dakota								X			X
Plains topminnow *Fundulus sciadicus*	South Dakota								X			X
Utah cutthroat trout *Salmo clarki utah*	Wyoming								X			X
June sucker *Chasmistes lucius*	Wyoming							X				X
Colorado cutthroat trout *Salmo clarki pleuriticus*	Wyoming								X			X
	Colorado								X			X
Rio Grande cutthroat trout *Salmo clarki virginalis*	Colorado								X			X
~~Johnny~~ darter *Etheostoma nigrum*	Colorado								X			X
*Plains orangethroat darter *Etheostoma spectabile pulchellum*	Colorado								X		X	
Arkansas River speckled chub *Hybopsis aestivalis tetranemus*	Colorado								X			X
*Arkansas darter *Etheostoma cragini*	Coloardo								X			X
	Kansas								X		X	
Greenback cutthroat trout *Salmo clarki stomias*	Colorado								X			X
Lake sturgeon *Acipenser fulvescens*	Nebraska								X			X
Brook stickleback *Culaea inconstans*	Nebraska								X			X
*Topeka shiner *Notropis topeka*	Kansas								X		X	
Blue sucker *Cycleptus elongatus*	Kansas								X			X
Neosho madtom *Noturus placidus*	Kansas							X				X
Ouachita madtom *Noturus lachneri*	Arkansas						X					X
Yellowcheek darter *Etheostoma moorei*	Arkansas						X					X
Paleback darter *Etheostoma pallididorsum*	Arkansas						X					X

Table A1. COMPREHENSIVE LIST (CONCLUDED).

Taxa	Known Distribution Relative to Project	Federal Status: Endangered	Federal Status: Threatened	Federal Status: Threatened by Similarity of Appearance	Federal Status: Proposed	Federal Status: Notice of Review	Federal Status: Status Review	State Status: Endangered	State Status: Threatened	State Status: Under State Review	Impact: May Affect	Impact: No Anticipated Effect
INVERTEBRATES												
Fat pocketbook pearly mussel *Proptera capax*	Kansas	X						X				X
	Arkansas	X										X
Scud *Allocrangonyx pellucidus*	Oklahoma					X						X
Scud *Bactrurus hubrichti*	Oklahoma					X						X
Bowman's cave scud *Stygonectes bowmani*	Oklahoma					X						
Ozark cave scud *Stygonectes ozarkensis*	Oklahoma					X						
	Arkansas					X						X
Pilsbry's narrow aperatured land snail *Stenotrema pilsbryi*	Oklahoma				X							X
	Arkansas				X							X
Strange many whorled land snail *Polygyra peregrina*	Arkansas				X							X
Magazine mountain middle-toothed land snail *Mesodon magazinensis*	Arkansas				X							X
* Wheeler's pearly mussel *Arkansia wheeleri*	Oklahoma					X						X
~~Freshwater mussel~~ *Cyprogenia aberti*	Arkansas						X				X	
* Neosho pearly mussel *Lampsilis rafinesqueana*	Oklahoma					X					X	
Scale pearly mussel *Leptodea leptodon*	Oklahoma					X						X
	Arkansas					X						X
Rough maple leaf pearly mussel *Quadrula fragosa*	Oklahoma					X						X
Freshwater mussel *Fusconia selecta*	Arkansas						X					
Plain pocketbook pearly mussel *Lampsilis satura*	Louisiana				X							X
Riffle beetle *Dubiraphia parva*	Kansas								X			X
Riffle beetle *Optioservus phaeus*	Kansas								X			X
Small amphibious snail *Pomatiopsis lapidaria*	Kansas							X				X
Warty-backed mussel *Quadrula nodulata*	Kansas							X				X
Heel splitter mussel *Anodonta suborbiculata*	Kansas							X				X

* "May Affect" species

Table A2. SECTION 7(c) COMPLIANCE LIST.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES

DEC 20 1979

60515A

Memorandum

To: Team Manager, Special Projects Environmental Impact Team, Bureau of Land Management, Denver, Colorado

From: Acting Deputy Associate Director

Subject: Species List, ETSI Coal Slurry Pipeline

We have reviewed your memoranda dated September 25, 1979 and October 3, 1979, and have compiled the requested information. It appears that some listed Endangered or Threatened species may occur in the area of influence of this action.

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. Therefore, we are furnishing you the following list of species which we believe may be present in the concerned area:

Whooping crane (Grus americana)

Occurs as a spring and fall migrant in many areas bisected by the proposed pipeline. This species presently nests only in Wood Buffalo National Park, Canada and winters along the Gulf Coast of Texas on Aransas National Wildlife Refuge and adjacent peninsulas and islands. Migratory route is nearly a straight line through west central North and South Dakota, central Nebraska and Kansas, west central Oklahoma and east central Texas. Major requirement in whooping crane habitat selection, particularly on migration, is an open expanse for nightly roosting. Sandbars or barren islands along river systems, such as the Platte River in Nebraska, are often selected as roost sites. Critical Habitat has been designated for whoopers and those areas in close proximity to the proposed pipeline include: Quivira National Wildlife Refuge and Cheyenne Bottoms State Waterfowl Management Area, Kansas; strips along the Platte River in Dawson, Gosper, Kearney, Buffalo and Phelps Counties, Nebraska; and Salt Plains National Wildlife Refuge, Oklahoma.

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

Arctic peregrine falcon (Falco peregrinus tundrius) and American peregrine falcon (Falco peregrinus anatum)

Both sub-species pass through many areas traversed by the proposed pipeline. Tundrius nests in tundra areas of Arctic Alaska, Canada and western Greenland. Migration occurs largely along the Atlantic coast but to some extent through the interior of the continent. No nest sites of anatum are known in the project area. Peregrines take a wide variety of avian prey including waterfowl, shorebirds, passerines, and occasionally upland species. Organochloride accumulation through the food chain, contributing to declines in reproductive success, appears to be responsible for population declines. The only impact that can be identified at this time would be associated with the reduction of available food in and adjacent to wetland areas.

Bald eagle (Haliaeetus leucocephalus)

Occurs throughout all States traversed by the proposed pipeline routes, primarily as winter residents. Wintering eagles are often associated with wintering waterfowl concentrations along river systems, lakes and reservoirs from October through April. These open water areas provide the food source for wintering eagles with fish and dead or crippled waterfowl constituting the bulk of their diet. Nesting eagles do occur in the States of Wyoming, Colorado, Oklahoma, Arkansas and Louisiana.

Red-cockaded woodpecker (Picoides (=Dendrocopos) borealis)

May occur in areas traversed by the White Bluff lateral in Jefferson County, the alternate barge loading facility line of Jefferson County and the Baton Rouge route in Jefferson, Cleveland and Ashley Counties, Arkansas, and in Morehouse and Catahoula Parishes in Louisiana. This woodpecker may also occur in upland sites of the Lake Charles lateral in the parishes of Catahoula, LaSalle, Rapides, Evangeline, Allen and Calcasieu. Avoidance of colony sites by the proposed pipeline will have to be based on surveys to reveal precise locations. Dr. Douglas James, University of Arkansas, Fayetteville, Department of Zoology, should be contacted for precise distributional data.

Eskimo curlew (Numenius borealis)

Has occurred in the State of Louisiana as a transient over areas to be traversed by the pipeline, but there will not likely be any impacts.

Ivory-billed woodpecker (Campephilus principalis) and Bachman's warbler (Vermivora bachmanii)

Both species were historically associated with bottomland hardwoods in southeastern U.S. The population and distribution of these species is undetermined at this time.

Gray bat (Myotis grisescens) and/or Indiana bat (Myotis sodalis)

The concern would be possible impacts to caves frequented by these two species. Our records do not show that these routes will impact any known cave sites. However, to insure against possibly impacting caves we are not aware of, it is recommended that Dr. Richard Laval, Recovery Team Leader for Gray/Indiana Bats, be contacted for the precise locations of any caves used by either species along the proposed routes. Areas that may be affected in Arkansas and traversed by the following alternate routes are: (a) current route in the counties of Crawford, Franklin, Johnson, Pope, Conway, Faulkner, White, St. Francis, Lee, Crittenden, Prairie and Woodruff; (b) Independence lateral in Independence, Jackson and White Counties; and (c) White Bluff lateral in Lonoke and Pulaski Counties. In Oklahoma, these species may be found in Adair and Cherokee counties and possibly in Mayes and Sequoyah counties.

Ozark big-eared bat (Plecotus townsendii ingens)

First listed as Endangered in the November 30, 1979, Federal Register. Known from Cave Springs Cave in Adair County, Oklahoma. Believed to exist only in relict populations in caves of the Ozark region.

Black-footed ferret (Mustela nigripes)

Ecologically, this species appears to be dependent on prairie dogs (Cynomys spp.) for food and shelter. For this reason, a county to county record will not be provided. However, ferret surveys will be required, prior to contruction, for all prairie dog towns bisected by any branch of the proposed pipeline, in the States of Wyoming, Nebraska, Colorado, Kansas, and Oklahoma.

Red Wolf (Canis rufus)

Occurs in extreme southwest Louisiana including Calcasieu Parish. This predator is sliding toward extinction at a rapid rate due to parasitism, disease and inbreeding with other members of the genus Canis. The niche of this species is being filled by coyotes, a species more adaptable and competitive than the red wolf. The possible effects of the pipeline in this area would appear minimal because the most recent distributional information in this parish would be well removed from the pipeline activity which will terminate near Lake Charles.

Florida panther (Felis concolor coryi)

At one time, this species was likely found throughout wilderness areas of Arkansas and Louisiana. Its presence, at this time, in Louisiana, is largely conjectural. Sightings, reports, etc., of this species continue to occur in remote areas of the Arkansas mountains and large river basins such as the Ouachita.

American alligator (Alligator mississippiensis) -

Occurs in Arkansas, mostly as a result of transplanting efforts by the State along the following alternate routes: (a) current route in the counties of Conway, Faulkner, White, St. Francis, Lee, Crittenden, Prairie and Woodruff; (b) Independence lateral in the counties of White and Jackson; (c) White Bluff lateral in the counties of Pulaski and Jefferson; (d) alternate barge loading facility line in Jefferson County. This species occurs in at least minimal numbers in all areas traversed by all proposed lines in Louisiana. The principal consideration with regard to the alligator is the possibility of wetland drainage in environments supporting alligators. Just about all natural wetland environments of Louisiana and some in Arkansas including sloughs, brakes, marshes, bayous, streams, oxbows, etc. may support this species.

Fat pocketbook (Potamilus (=Proptera) capax)

This mussel has been collected from the Black, White and St. Francis Basins of Arkansas. In the last 2 years, collections have been made at river miles 37.8, 41.0, 44.8, 45.8 and 49.0 of the St. Francis River in St. Francis County. All proposed stream crossings in the White and St. Francis Basins should be surveyed for this species by a competent malacologist.

Section 7(c) also requires agencies to provide a biological assessment for the species which are likely to be affected. The biological assessment shall be completed within 180 days after the date on which initiated, before any contracts for construction are entered into, and before construction is begun. We do not feel that we can adequately assess the effects of the proposed action on listed and proposed species or Critical Habitat without a complete assessment. The Federal agency shall provide the following minimum information when conducting a biological assessment:

(i) Conduct an on-site inspection of the area affected by the proposed activity or program, which may include a detailed survey of the area to determine if species are present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of populations;

(ii) Interview recognized experts on the species at issue, including those within the Fish and Wildlife Service, the National Marine Fisheries Service, State conservation departments, universities and others who may have data not yet found in the scientific literature;

(iii) Review literature and other scientific data to determine the species' distribution, habitat needs and other biological requirements;

(iv) Review and analyze the effects of the proposal on the species, in terms of individuals and populations, including consideration of the cumulative effects of the proposal on the species and its habitat;

(v) Analyze alternative actions that may provide conservation measures.

The Fish and Wildlife Service representative who will provide you with technical assistance is Larry Kline, Section 7 Team Leader, Office of Endangered Species, telephone FTS 235-2760, commercial (703)235-2760.

After your agency has completed and reviewed the assessment, it is your responsibility to determine if the proposed action "may affect" any of the listed species or Critical Habitats. If the determination is "may affect," you shall initiate a written request for consultation to the Director, U.S. Fish and Wildlife Service. At this time you should provide a copy of the biological assessment and any other relevant information that assisted you in reaching your conclusion.

Your attention is also directed to Section 7(d) of the 1978 Amendment to the Endangered Species Act, which underscores the requirement that the Federal agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable alternatives regarding their actions on any Endangered or Threatened species.

If we can be of further assistance, please advise.

Charles K. Dawson

Table A2. SECTION 7(c) COMPLIANCE LIST. (Concluded)

Section 7(c) Compliance List for South Dakota (Oahe Line)*
Peregrine Falcon
Bald Eagle
Whooping Crane
Black-Footed Ferret

*Gill, William. 1980. Personal Communications with D. Olson and G. Mancini (WCC) on 17 April 1980 at ETSI Project Meeting, Little Rock, Arkansas. Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, DC.

Table A3. · THREATENED AND ENDANGERED SPECIES PROTECTED BY SOUTH DAKOTA UNDER GENERAL AUTHORITY: SDCL 41-2-32, 41-2-8, 34A-8-3.

NAME	STATUS
PLANTS	
None	
INVERTEBRATES	
None	
FISH	
Central mudminnow *Umbra limi*	ENDANGERED
Pearl dace *Semotilus margarita*	ENDANGERED
Banded killifish *Fundulus diaphanus*	ENDANGERED
Pallid sturgeon *Scaphirhynchus albus*	THREATENED
Sturgeon chub *Hybopsis gelida*	THREATENED
Sicklefin chub *Hybopsis meeki*	THREATENED
Northern redbelly dace *Phoxinus eos*	THREATENED
Finescale dace *Phoxinus neogaeus*	THREATENED
Longnose sucker *Catostomus catostomus*	THREATENED
Trout-perch *Percopsis omiscomaycus*	THREATENED
Plains topminnow *Fundulus sciadicus*	THREATENED

Table A3. THREATENED AND ENDANGERED SPECIES PROTECTED BY SOUTH DAKOTA UNDER GENERAL AUTHORITY: SDCL 41-2-32, 41-2-8, 34A-8-3. (Continued)

NAME	STATUS
AMPHIBIANS AND REPTILES	
Blanding's turtle *Emydoidea blandingi*	THREATENED
False map turtle *Graptemys pseudogeographica*	THREATENED
Spiny softshell turtle *Trionyx spiniferus*	THREATENED
Eastern hognose snake *Heterodon platyrhinos*	THREATENED
Lined snake *Tropidoclonion lineatum*	THREATENED
Brown snake *Storeria dekayi*	THREATENED
Northern red-bellied snake *Storeria occipitomaculata*	THREATENED
BIRDS	
Bald eagle* *Haliaeetus leucocephalus*	ENDANGERED
Peregrine falcon* *Falco peregrinus anatum*	ENDANGERED
Whooping crane *Grus americana*	ENDANGERED
Eskimo curlew* *Numenius borealis*	ENDANGERED
Interior least tern *Sterna albifrons athalassos*	ENDANGERED

* Federally protected (*Federal Register*, 17 January 1979).

Table A3. THREATENED AND ENDANGERED SPECIES PROTECTED BY SOUTH DAKOTA UNDER GENERAL AUTHORITY: SDCL 41-2-32, 41-2-8, 34A-8-3. (Concluded)

NAME	STATUS
Osprey *Pandion haliaetus*	THREATENED
Buff-breasted sandpiper *Tryngites subruficollis*	THREATENED
MAMMALS	
Black-footed ferret* *Mustela nigripes*	ENDANGERED
Northern swift fox *Vulpes velox hebes*	THREATENED
River otter *Lutra canadensis interior*	THREATENED
Mountain lion *Felis concolor*	THREATENED
Black bear *Ursus americanus*	THREATENED

* Federally protected (*Federal Register*, 17 January 1979).

Table A4. WILDLIFE CONSIDERED RARE IN WYOMING (WYOMING GAME AND FISH DEPARTMENT 1977).

Name	Status
MAMMALS	
Spotted bat *Euderma maculata*	RARE
Meadow jumping mouse *Zapus hudsonius*	RARE
Wolverine *Gulo luscus*	RARE
Black-footed ferret *Mustela nigripes*	RARE
BIRDS	
Least tern *Sterna albifrons*	RARE
Purple martin *Progne subis*	RARE
Brown-capped rosy finch *Leucosticte atrata*	RARE
Scrub jay *Aphelocoma coerulescens*	RARE
Burrowing owl *Speotyto cursicularia*	RARE
Peregrine falcon *Falco peregrinus*	RARE
Whooping crane *Grus americana*	RARE
Columbian sharp-tailed grouse *Pedioecetes phasianellus*	RARE

Table A4. WILDLIFE CONSIDERED RARE IN WYOMING (WYOMING GAME AND FISH DEPARTMENT 1977). (Continued)

Name	Status
HERPTILES	
Rocky Mountain rubber boa *Charina bottae*	RARE
Western smooth green snake *Opheodrys vernalis*	RARE
Red-bellied snake *Storeria occipitomaculata*	RARE
Milk snake *Lampropeltis triangulum*	RARE
Wood frog *Rana sylvatica*	RARE
FISHES	
Kendall warm springs dace *Rhinichthys osculus thermalis*	RARE
Colorado River cutthroat trout *Salmo clarki pleuriticus*	RARE
Utah cutthroat trout *Salmo clarki utah*	RARE
Shovelnose sturgeon *Scaphirhynchus platorynchus*	RARE
Goldeye *Hiodon alosoides*	RARE
Northern pearl dace *Semotilus margarita nachtriebi*	RARE
Finescale dace *Phoxinus neogaeus*	RARE

Table A4. WILDLIFE CONSIDERED RARE IN WYOMING (WYOMING GAME AND FISH DEPARTMENT 1977). (Concluded)

Name	Status
Hornyhead chub *Nocomis biguttatus*	RARE
Sturgeon chub *Hybopsis gelida*	RARE
Leatherside chub *Gila copei*	RARE
Suckermouth minnow *Phenacobius mirabilis*	RARE
Bluehead sucker *Catostomus discobolus*	RARE
Common shiner *Notropis cornutus*	RARE
Silvery minnow *Hybognathus nuchalis*	RARE

Table A5. THREATENED AND ENDANGERED SPECIES PROTECTED BY COLORADO UNDER CHAPTER 10 OF THE WILDLIFE COMMISSION REGULATIONS (STATUTORY REFERENCE 33-3-106, 33-4-107, AND 33-40-102).

NAME	STATUS
PLANTS	
None	
INVERTEBRATES	
None	
FISH	
Colorado River squawfish* *Ptychocheilus lucius*	ENDANGERED
Humpback chub *Gila cypha*	ENDANGERED
Bonytail chub *Gila elegans*	ENDANGERED
Humpback sucker *Xyrauchen texanus*	ENDANGERED
Arkansas River speckled chub *Hybopsis aestivalis tetranemus*	THREATENED
Central johnny darter *Etheostoma nigrum nigrum*	THREATENED
Plains orangethroat darter *Etheostoma spectabile pulchellum*	THREATENED
Colorado River cutthroat trout *Salmo clarki pleuriticus*	THREATENED
Rio Grande cutthroat trout *Salmo clarki virginalis*	THREATENED

* Federally protected (*Federal Register*, 17 January 1979).

Table A5. THREATENED AND ENDANGERED SPECIES PROTECTED BY COLORADO UNDER CHAPTER 10 OF THE WILDLIFE COMMISSION REGULATIONS (STATUTORY REFERENCE 33-3-106, 33-4-107, AND 33-40-102) (Continued)

NAME	STATUS
Greenback cutthroat trout *Salmo clarki stomias*	THREATENED
Arkansas darter *Etheostoma cragini*	THREATENED
AMPHIBIANS AND REPTILES	
Mountain wood frog *Rana sylvatica*	THREATENED
BIRDS	
Peregrine falcon* *Falco peregrinus anatum* and *F. p. tundrius*	ENDANGERED
Bald eagle* *Hilaeetus leucocephalus*	ENDANGERED
Greater prairie chicken *Tympanuchus cupido*	ENDANGERED
Prairie sharp-tailed grouse *Pediocetes phasianellus jamesii*	ENDANGERED
Whooping crane* *Grus americana*	ENDANGERED
Greater sandhill crane *Grus canadensis tabida*	ENDANGERED
White pelican *Pelecanus erythrorhynchos*	THREATENED
Lesser prairie chicken *Tympanuchus pallidicinctus*	THREATENED

* Federally protected (Federal Register, 17 January 1979).

Table A5. THREATENED AND ENDANGERED SPECIES PROTECTED BY COLORADO UNDER CHAPTER 10 OF THE WILDLIFE COMMISSION REGULATIONS (STATUTORY REFERENCE 33-3-106, 33-4-107, AND 33-40-102) (Concluded)

NAME	STATUS
MAMMALS	
Gray wolf* *Canis lupus*	ENDANGERED
Grizzly bear* *Ursus arctos*	ENDANGERED
Black-footed ferret* *Mustela nigripes*	ENDANGERED
River otter *Lutra canadensis*	ENDANGERED
Lynx *Lynx canadensis*	ENDANGERED

* Federally protected (Federal Register, 17 January 1979).

Table A6. THREATENED AND ENDANGERED SPECIES PROTECTED BY NEBRASKA UNDER THE NON-GAME AND ENDANGERED SPECIES CONSERVATION ACT (UNDER AUTHORITY AND IN COMPLIANCE WITH STATUTORY REFERENCES 37-430 AND 37-438).

NAME	STATUS
PLANTS	
None	
INVERTEBRATES	
None	
FISH	
Lake sturgeon *Acipenser fulvescens*	THREATENED
Pallid sturgeon *Scaphirhynchus albus*	THREATENED
Northern redbelly dace *Phoxinus eos*	THREATENED
Pearl dace *Semotilus margarita*	THREATENED
Finescale dace *Phoxinus neogaeus*	THREATENED
Brook stickleback *Culaea inconstans*	THREATENED
BIRDS	
Peregrine falcon* *Falco peregrinus anatum* and *F. p. tundrius*	ENDANGERED

* Federally protected (Federal Register, 17 January 1979).

Table A6. THREATENED AND ENDANGERED SPECIES PROTECTED BY NEBRASKA UNDER THE NON-GAME AND ENDANGERED SPECIES CONSERVATION ACT (UNDER AUTHORITY AND IN COMPLIANCE WITH STATUTORY REFERENCES 37-430 AND 37-438). (Concluded)

NAME	STATUS
Whooping crane* *Grus americana*	ENDANGERED
Eskimo curlew* *Numenius borealis*	ENDANGERED
Interior least tern *Sterna albifrons athalassos*	THREATENED
Mountain plover *Chardrius montanus*	THREATENED
MAMMALS	
Black-footed ferret* *Mustela nigripes*	ENDANGERED
Swift fox *Vulpes velox*	ENDANGERED
Southern flying squirrel *Glaucomys volans*	THREATENED

* Federally protected (Federal Register, 17 January 1979).

Table A7. THREATENED AND ENDANGERED SPECIES PROTECTED BY THE KANSAS NONGAME, THREATENED, OR ENDANGERED SPECIES ACT (K. S. A. 32-501-510; COMPILED AND EFFECTIVE 1 MAY 1978).

NAME	STATUS
PLANTS	
None	
INVERTEBRATES	
Small amphibious snail *Pomatiopsis lapidaria*	ENDANGERED
Warty-backed mussel *Quadrula nodulata*	ENDANGERED
Heel-splitter mussel *Anodonta suborbiculata*	ENDANGERED
Fat pocketbook pearly mussel* *Proptera capax*	ENDANGERED
Riffle beetle *Dubiraphia n. sp.*	THREATENED
Riffle beetle *Optioservus n. sp.*	THREATENED
FISH	
Neosho madtom *Noturus placidus*	ENDANGERED
Pallid sturgeon *Scaphirhynchus albus*	ENDANGERED
Sicklefin chub *Hybopsis meeki*	ENDANGERED
Blue sucker *Cycleptus elongatus*	THREATENED

* Federally protected (*Federal Register*, 17 January 1979).

Table A7. THREATENED AND ENDANGERED SPECIES PROTECTED BY THE KANSAS NONGAME, THREATENED, OR ENDANGERED SPECIES ACT (K. S. A. 32-501-510; COMPILED AND EFFECTIVE 1 MAY 1978). (Continued)

NAME	STATUS
Arkansas darter *Etheostoma cragini*	THREATENED
Topeka shiner *Notropis topeka*	THREATENED
AMPHIBIANS AND REPTILES	
Central newt *Notophthalmus viridescens louisianensis*	ENDANGERED
Grotto salamander *Typhlotriton spelaeus*	ENDANGERED
Gray-bellied salamander *Eurycea multiplicata griseogaster*	ENDANGERED
Cave salamander *Eurycea lucifuga*	ENDANGERED
Alligator snapping turtle *Macroclemys temmincki*	THREATENED
Northern crawfish frog *Rana areolata circulosa*	THREATENED
BIRDS	
Peregrine falcon* *Flaco peregrinus anatum*	ENDANGERED
Whooping crane* *Grus americana*	ENDANGERED
Eskimo curlew* *Numenius borealis*	ENDANGERED

* Federally protected (*Federal Register*, 17 January 1979).

Table A7. THREATENED AND ENDANGERED SPECIES PROTECTED BY THE KANSAS NONGAME, THREATENED, OR ENDANGERED SPECIES ACT (K. S. A. 32-501-510; COMPILED AND EFFECTIVE 1 MAY 1978). (Concluded)

NAME	STATUS
Bald eagle* *Haliaeetus leucocephalus*	ENDANGERED
Prairie falcon *Falco mexicanus*	THREATENED
Least tern *Sterna albifrons*	THREATENED
MAMMALS	
Black-footed ferret* *Mustela nigripes*	ENDANGERED
Gray bat *Myotis grisescens*	ENDANGERED

* Federally protected (Federal Register, 17 January 1979).

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979).

Taxa	Former Proposed Status**
WYOMING	
Nuttall daisy *Townsendia nuttallii*	Threatened
Dissected prince's plume *Stanleya pinnata* var. *gibberosa*	Threatened
Laramie false sagebrush *Sphaeromeria simplex*	Threatened
Tufted twinpod *Physaria condensata*	Threatened
Icegrass *Phippsia algida*	Threatened
Cary beardtongue *Penstemon caryi*	Threatened
Stemless beardtongue *Penstemon acaulis*	Threatened
Feverfew, unnamed *Parthenium ligulatum*	Endangered
Wyoming feverfew *Parthenium alpinum*	Threatened
Large-fruited bladderpod *Lesquerella macrocarpa*	Endangered
Fremont's bladderpod *Lesquerella fremontii*	Endangered
Goldenweed, unnamed *Haplopappus contractus*	Endangered
Colorado butterfly-weed *Gaura neomexicana* ssp. *coloradensis*	Endangered
Big horn wild buckwheat *Eriogonum brevicaule* ssp. *canum*	Threatened
Bristly fleabane *Erigeron allocotus*	Threatened
Comb-hair draba *Draba pectinipila*	Threatened
Little snow draba *Draba nivalis* var. *brevicula*	Threatened
Sedge, unnamed *Carex microptera* var. *crassinervia*	Threatened
Precocious milkvetch *Astragalus proimanthus*	Endangered
Bastard draba milkvetch *Astragalus drabelliformis*	Threatened

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979). (Continued)

Taxa	Former Proposed Status**
WYOMING, Continued	
Porter sagebrush *Artemisa porteri*	Threatened
Yellowstone rockcress *Arabis fructicosa*	Endangered
Draggett rockcress *Arabis demissa* var. *languida*	Threatened
Laramie columbine *Aquilegia laramiensis*	Threatened
Limestone columbine *Aquilegia jonesii*	Threatened
Meadow pussy-toes *Antennaria arcuata*	Endangered
Ross bentgrass *Agrostis rossia*	Threatened
COLORADO	
No common name *Trifolium lemmonii*	Endangered
No common name *Sullivantia purpusii*	Threatened
Starwort, unnamed *Stellaria irrigua*	Endangered
Porter's groundsel *Senecio porteri*	Endangered
Mesa Verde cactus *Sclerocactus mesa-verde*	Endangered
No common name *Sclerocactus glaucus*	Endangered
Watercress, unnamed *Rorippia coloradensis*	Threatened
Icegrass *Phippsia algida*	Threatened
Scorpionweed, unnamed *Phacelia submutica*	Endangered
Scorpionweed, unnamed *Phacelia formosula*	Endangered
Beardtongue, unnamed *Penstemon retrorsus*	Endangered
Knowlton's hedgehog cactus *Pediocactus knowltonii*	Endangered

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979). (Continued)

Taxa	Former Proposed Status**
COLORADO, Continued	
Feverfew, unnamed *Parthenium ligulatum*	Endangered
No common name *Parrya nudicaulis*	Threatened
Locoweed *Oxytropis obnapiformis*	Endangered
No common name *Neoparrya lithophila*	Endangered
Greenleaf bluebells *Mertensia viridis* var. *cana*	Threatened
Bladderpod, unnamed *Lesquerella pruinosa*	Endangered
Golden weed, unnamed *Haplopappus fremontii* ssp. *monocephalus*	Endangered
Colorado butterfly-weed *Gaura neomexicana* ssp. *coloradensis*	Endangered
Fescue grass, unnamed *Festuca dasyclada*	Endangered
No common name *Eutrema penlandii*	Endangered
Wild buckwheat, unnamed *Erigonum viridulum*	Threatened
Dinosaur buckwheat *Erigonum saurinum*	Threatened
Clay-loving buckwheat *Eriogonum pelinophilum*	Endangered
Wild buckwheat, unnamed *Eriogonum ephedroides*	Endangered
Comb wash buckwheat *Eriogonum clavellatum*	Threatened
Brandegee's buckwheat *Erigonum brandegei*	Threatened
Spineless hedgehog cactus *Echinocereus triglochidiatus* var. *inermis*	Endangered
Whitlow-wort *Draba exunguiculata*	Threatened
Weber's catseye *Cryptantha weberi*	Endangered
Catseye, unnamed *Cryptantha stricta*	Endangered
Catseye, unnamed *Cryptantha elata*	Endangered

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979). (Continued)

Taxa	Former Proposed Status**
COLORADO, Continued	
Catseye, unnamed *Cryptantha aperta*	Endangered
No common name *Corydalis caseana* var. *caseana*	Endangered
Sedge, unnamed *Carex microptera* var. *crassinervia*	Threatened
No common name *Braya humilis* ssp. *ventosa*	Endangered
Saltbush, unnamed *Atriplex pleiantha*	Endangered
Wetherill milkvetch *Astragalus wetherillii*	Threatened
Schmoll's milkvetch *Astragalus schmollae*	Endangered
Osterhout's milkvetch *Astragalus osterhoutii*	Endangered
Milkvetch, unnamed *Astragalus naturitensis*	Endangered
Milkvetch, unnamed *Astragalus microcymbus*	Endangered
Grand Junction milkvetch *Astragalus linifolius*	Endangered
Mancos milkvetch *Astragalus humillimus*	Endangered
Debris milkvetch *Astragalus detritalis*	Endangered
Cliff-palace milkvetch *Astragalus deterior*	Endangered
Rockcress, unnamed *Arabis oxylobula*	Endangered
Rockcress, unnamed *Arabis gunnisoniana*	Endangered
Spurless small-flowered columbine *Aquilegia micrantha* var. *mancosana*	Endangered
Columbine, unnamed *Aquilegia chrysantha* var. *rydbergii*	Threatened
OKLAHOMA	
Hairy pod vetch *Vicia reverchonii*	Endangered

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979). (Continued)

Taxa	Former Proposed Status**
OKLAHOMA, Continued	
Jewelflower, unnamed *Streptanthus squamiformis*	Endangered
False dragon-head, unnamed *Physostegia micrantha*	Threatened
Horsemint, unnamed *Monarda stipitatoglandulosa*	Threatened
Bladderpod, unnamed *Lesquerella angustifolia*	Threatened
Golden glade cress *Leavenworthia aurea*	Endangered
Pipewort, unnamed *Eriocaulon kornickianum*	Endangered
Ozark chinquapin *Castanea ozarkensis*	Endangered
Sedge, unnamed *Carex latebracteata*	Threatened
Poppy-mallow, unnamed *Callirhoe papaver* var. *bushii*	Threatened
Sandgrass, unnamed *Calmovilfa arcuata*	Endangered
Alder, unnamed *Alnus maritima*	Threatened
KANSAS	
Rein-orchid, unnamed *Platanthera leucophaea*	Threatened
Mead's milkweed *Asclepias meadii*	Endangered
NEBRASKA	
Rein-orchid, unnamed *Platanthera leucophaea*	Threatened
ARKANSAS	
Meadow-rue, unnamed *Thalicitrum debile*	Threatened
Jewelflower, unnamed *Streptanthus squamiformis*	Endangered

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979). (Continued)

Taxa	Former Proposed Status**
ARKANSAS, Continued	
Stonecrop, unnamed *Sedum pusillum*	Threatened
Sunnybell, unnamed *Schoenolirion texanum*	Endangered
Maple leaf-oak *Quercus shumardii* var. *acerifolia*	Threatened
Rein-orchid, unnamed *Platanthera peramoena*	Threatened
Rein-orchid, unnamed *Platanthera leucophaea*	Threatened
Rein-orchid, unnamed *Platanthera flava*	Threatened
Beard-tongue, unnamed *Penstemon multicaulis*	Threatened
Beard-tongue, unnamed *Penstemon cobaea* var. *purpureus*	Threatened
Evening-primrose, unnamed *Oenothera sessilis*	Endangered
Alabama snow-wreath *Neviusia alabamensis*	Threatened
Arkansas alumroot *Heuchera arkansana*	Threatened
Geocarpon *Geocarpon minimum*	Endangered
Pipewort, unnamed *Eriocaulon kornickianum*	Endangered
No common name *Draba aprica*	Endangered
French's shooting star *Dodecathon frenchii*	Threatened
Trelease's delphinium *Delphinium treleasei*	Threatened
Moore's delphinium *Delphinium nowtonianum*	Threatened
Ozark chinquapin *Castanea ozarkensis*	Endangered
Spleenwort, unnamed *Asplenium kentuckiensis*	Threatened

Table A8. (FORMER) FEDERALLY PROPOSED* ENDANGERED AND THREATENED PLANT SPECIES REVIEWED (removed from proposed status 10 November 1979). (Concluded)

Taxa	Former Proposed Status**
LOUISIANA	
Skullcap, unnamed *Scutellaria thieretii*	Threatened
Pitcher plant *Sarracenia psittacina*	Threatened
Spicebush, unnamed *Lindera melissifolia*	Threatened
Louisiana quillwort *Isoetes louisianensis*	Endangered
Holly, unnamed *Ilex amelanchier*	Threatened
Rein-orchid, unnamed *Platanthera leucophaea*	Threatened
Coreopsis, unnamed *Coreopsis intermedia*	Endangered
Indian paintbrush *Castilleja ludoviciana*	Endangered
Beardgrass, unnamed *Bothriochloa exaristata*	Threatened
Blue-star *Amsonia glaberrima*	Threatened
False foxglove, unnamed *Agalinis caddoensis*	Threatened

*Reference the proposed endangered and threatened plant species, Federal Register 40:27824-27984 July 1 1975; and the proposed endangered plant species, Federal Register 41:24524-24572 June 16 1976.

**Once a species is proposed threatened or endangered it is placed on a two-year time limit in accordance with ammendments to the Endangered Species Act of 1973. If the species is not listed before the two years expire, it is delisted from the proposed list. These plants reached their expiration data in 1978 and consequently were removed from immediate consideration. These species could be reproposed if new information becomes available.

TABLE A9. A DRAFT PROPOSAL TO THE U.S. FISH AND WILDLIFE FOR A MEMORANDUM OF AGREEMENT BETWEEN THE BUREAU OF LAND MANAGEMENT AND THE FISH AND WILDLIFE SERVICE FOR THE ENERGY TRANSPORTATION SYSTEM, INC. (ETSI) COAL SLURRY PIPELINE PROJECT

A DRAFT PROPOSAL TO THE U.S. FISH AND WILDLIFE FOR A MEMORANDUM OF AGREEMENT BETWEEN THE BUREAU OF LAND MANAGEMENT AND THE FISH AND WILDLIFE SERVICE FOR THE ENERGY TRANSPORTATION SYSTEM, INC. (ETSI) COAL SLURRY PIPELINE

Introduction

This Memorandum of Understanding (MOU) is written to assure compliance with the Endangered Species Act and the Section 7 consultation requirements for the Engery Transportation System, Inc. (ETSI) Coal Slurry Pipeline which is being designed to carry coal slurry from Gillette, Wyoming, to markets in Arkansas, Oklahoma, and Louisiana. The proposed line, or its alternatives, cross Wyoming, Nebraska, Kansas, Oklahoma, Arkansas, Louisiana, Colorado, and South Dakota.

The Bureau of Land Management (BLM) is the lead Federal agency for the project and is responsible for issuing an environmental impact statement, rights-of-way permits on Federal lands, and Notice to Proceed and is responsible for compliance with the Endangered Species Act.

Several Threatened or Endangered (T&E) species that could occur along the pipeline route have been identified by the Fish and Wildlife Service (FWS) by letters dated 12/20/79 and 6/2/80 (attached). Of the T&E species lists submitted by the FWS, 8 of the 13 species have been categorized by BLM as not being affected by the ETSI project. Five species, however, have been determined by BLM to be in a "May Affect" category. Those five species are: black-footed ferret, red-cockaded woodpecker, bald eagle, American alligator, and whooping crane.

To reach these conclusions, ETSI's contractor (Woodward-Clyde Consultants) contacted several FWS offices, various endangered species recovery teams, and concerned state wildlife agencies. Information on life histories, areas of occurrence, and potential impacts from the pipeline project was

collected. Where possible, proposed pipeline alignments were rerouted to minimize conflicts with T&E species.

The contractor has compiled all the information on the T&E species into a technical report, "Endangered and Threatened Species Technical Report, ETSI Coal Slurry Pipeline Project." This technical report has served as the basis for BLM's Biological Assessment which is submitted along with this MOU.

Of the five T&E species in the "may affect" category, BLM has determined that the bald eagle, American alligator, and whooping crane are adequately addressed in the Biological Assessment for this project, which includes the description of potential conflicts and methods to deal with the conflicts to ensure that the three species are not adversely impacted. Additional stipulations may be in the Biological Opinion which will be prepared by FWS.

For the two remaining T&E species (black-footed ferret and red-cockaded woodpecker), the extent of the conflicts are not known at this time. Surveys are required for both species to identify the extent of any conflicts. Once these conflict areas are known, procedures can be prescribed to ensure that these two T&E species are not adversely impacted.

The remainder of this MOU describes the procedures to be followed by BLM and the survey methodologies recommended by FWS to be used for black-footed ferret and red-cockaded woodpeckers.

STIPULATIONS

The BLM will ensure that the following measures are carried out:

1. ETSI will be required to allocate sufficient funds and time in advance of construction of any element of the pipeline system and its related facilities to perform adequate inventories on the black-footed ferret and the red cockaded woodpecker.

2. ETSI will also be required to prepare and disseminate to the Authorized Officer the results and inventory reports. The Authorized Officer will ensure that the endangered species inventory and evaluation will be of suitable quality to meet all FWS survey procedures.

   The Authorized Officer will then submit to the FWS the results of the inventories.

3. If a black-footed ferret or red cockaded woodpecker problem is encountered, BLM will ensure that the concerned species is not adversely impacted by implementing one or more of the following actions:

   - o Move pipeline
   - o Change time of year of construction
   - o Stop the project
   - o For black-footed ferret, an additional step could be considered, that of moving the ferret

4. Construction of the pipeline should begin within 1 year of the surveys to eliminate any need for resurveys.

5. The prescribed survey methodologies are described in Appendix 1 for black-footed ferret and Appendix 2 for red-cockaded woodpecker. For black-footed ferret, alternate method number 2 will be used for the ETSI project since the Notice to Proceed will not be issued until the surveys are completed and any identified conflicts are resolved.

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